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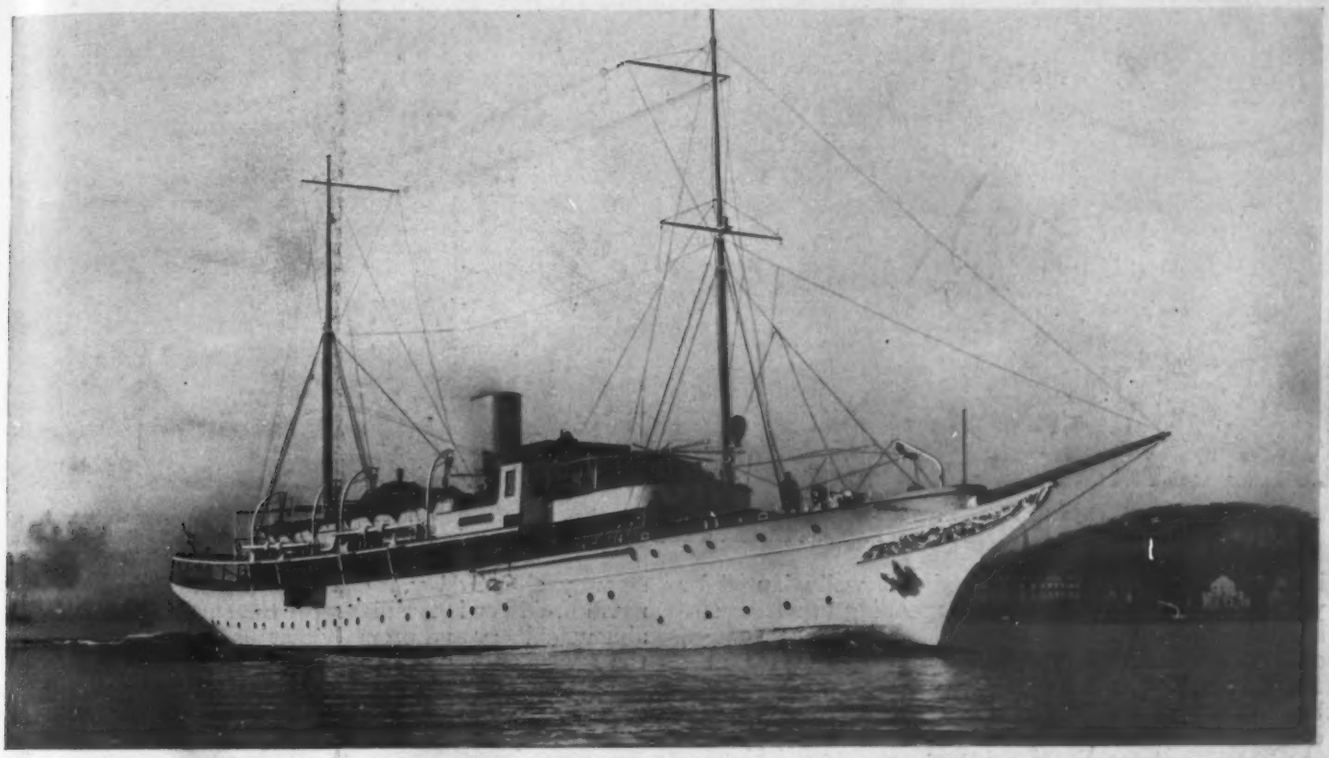


In large Diesel-powered yachts the trend is back towards the graceful clipper bow. This is the *Happy Days*, designed by Cox & Stevens for I. C. Copley. She is 196 feet in length.

The Use of Diesel Engines in Yachts

What This Type of Power Has Accomplished in Increasing Cruising Radius and Reducing Cost of Operation

By DANIEL H. COX

THE outstanding development in yacht design during the past ten years has been the substitution of the Diesel engines for the various types of steam engines previously used. Diesel engines have also in many instances been installed in yachts that otherwise would have been driven by gasoline engines.

To appreciate fully the advantages of this type of engine, and the effect of its use upon yacht design and operation, requires a brief description of its outstanding features.

The Diesel engine uses a grade of oil for fuel that is not explosive or dangerous. The engine is of the internal combustion type, as is also the gasoline engine, but differs from the latter in the fact that the charge in the cylinders above the pistons is fired simply by the heat of compression and not by an electric spark.

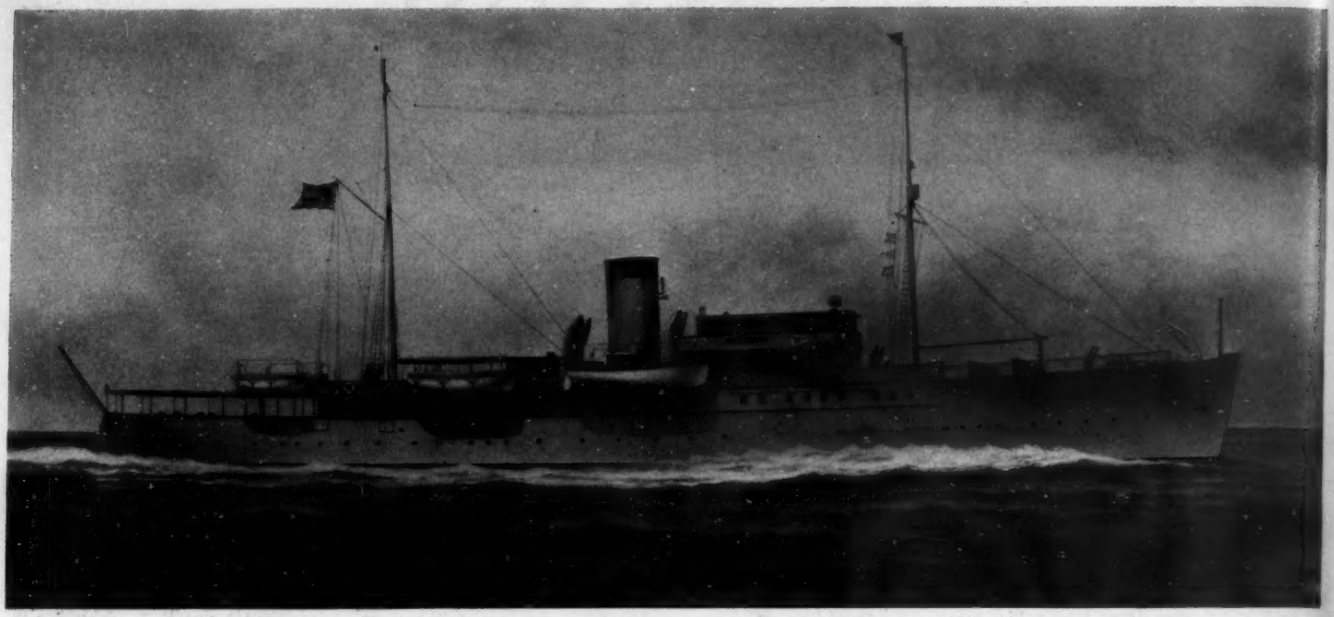
The grade of oil used is inexpensive and the economy in fuel consumption is so great that, compared with a steam installation of the ordinary marine type, only one-third as much fuel is required to drive a certain vessel a given distance when using Diesel engines as would be required if it were propelled by steam engines.

The Diesel engine can be started instantaneously at any time, the initial revolutions being secured by the use of compressed air, and the engine at once commencing to operate in its regular manner and requiring no preheating, or priming.

As a rule it will be found that when Diesel engines are used there is a considerable saving in space occupied by machinery compared with what would be necessary for steam engines and boilers. Also the number of the crew will be somewhat less as the fireroom force will be eliminated. The main saving is in room, however, and it is an immense saving if a yacht is to have a cruising radius worth the name, and is caused by the fact that in the case of Diesel engines it is necessary to allow only one-third the space for fuel that would be required for a steam installation having the same steaming radius.

All these advantages are so obvious that one naturally inquires why the Diesel engine did not enter the yachting field long ago, as this type of power has been in use for many years. The answer is that the earlier engines of this type were relatively crude, heavy machines, not really applicable to yacht use. Also, they were exceedingly expensive, there was difficulty in getting competent engineers to handle them, and many skeptics were doubtful as to their reliability.

The Diesel engine of today, while naturally still being

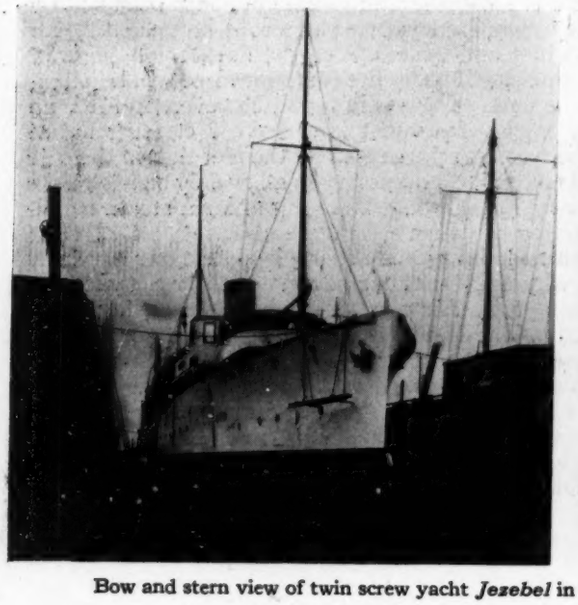


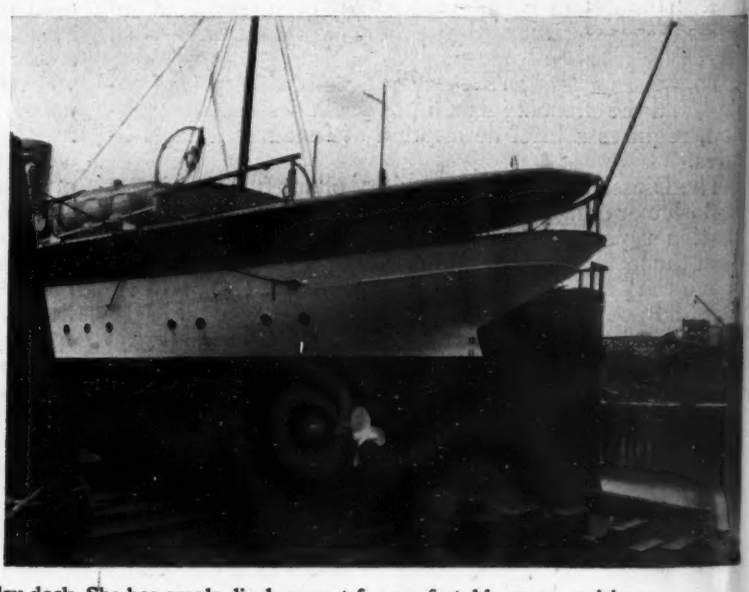
Drawing of a new Diesel yacht for Vincent Astor, and now under construction. She will be 264 feet over all, and her power will consist of two 1500 h.p. Diesels. Cox & Stevens are the designers.

improved and refined in construction, is well adapted for yacht use in every particular. Depending upon the size and type of yacht and the power required, engines of suitable dimensions and weight can be selected from the many reliable types on the market. Even for yachts of high speed it is possible to secure Diesel engines of special design developing the required power on extremely light machinery weights, and at a high rate of revolutions. There is now no difficulty whatever in finding competent engineers to handle this type of machinery, as all intelligent men are anxious to qualify for such work. The reliability of the Diesel engine has been proven beyond all doubt, its continuous use on extended voyages to all parts of the world having convinced even the most skeptical yachtsman.

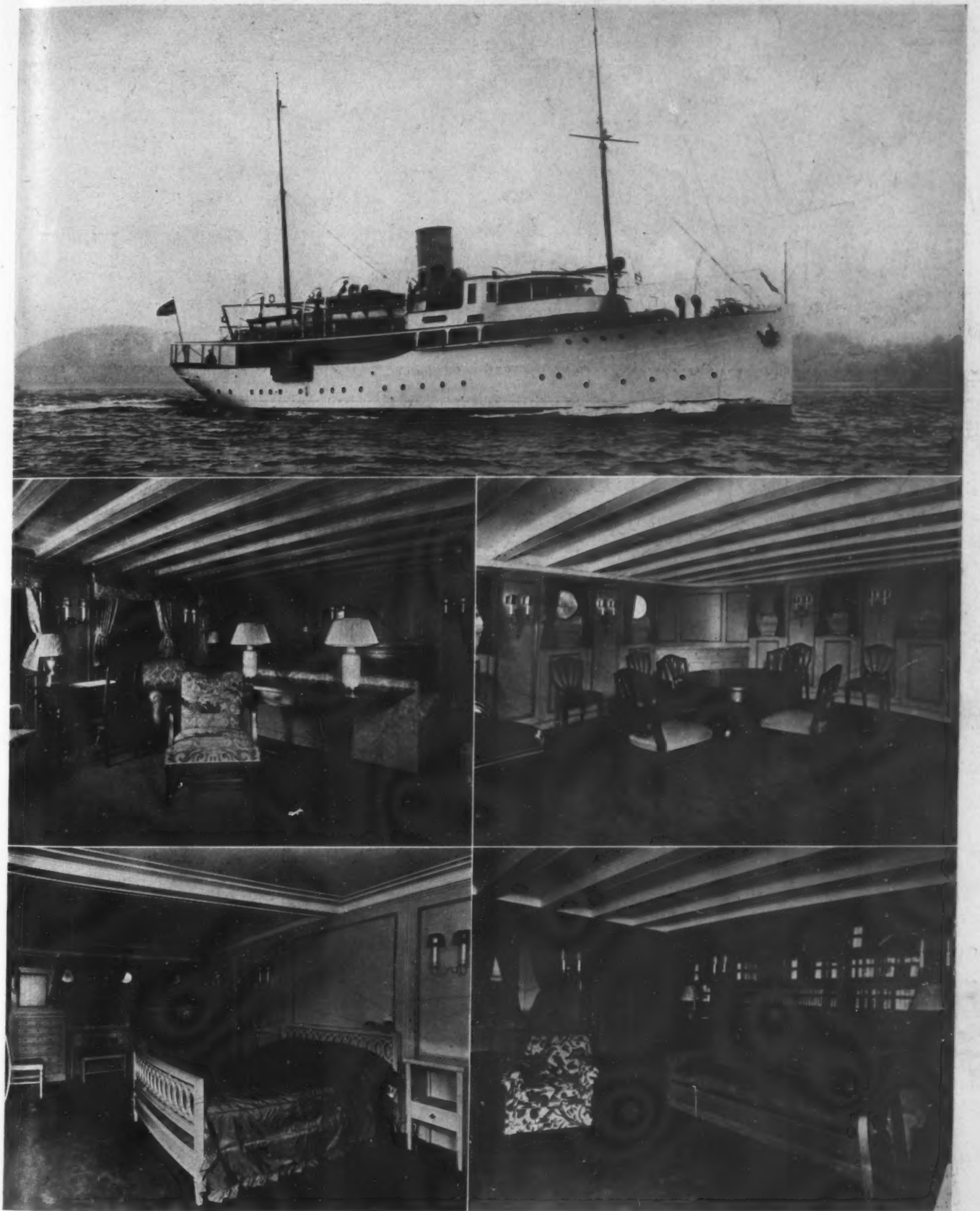
One point has been stressed unduly against the Diesel engine, namely, that its use may produce undue vibration. The earlier engines of this type were not as well balanced as those now being built, and the science of preventing vibration by proper design of hull, structure and machinery foundations was not as generally understood as it is today. Consequently, there was in certain of the earlier Diesel yachts more vibration than in similar steam yachts. Today, it can be said truthfully that if the naval architect is familiar with the subject, selects suitable machinery and properly installs it in a suitable hull, the owner will have a yacht as free from vibration as would be possible were steam engines of equal power installed. In fact, the vibration caused by the use of Diesel engines may be said to have been eliminated as a source of annoyance.

Another argument against the use of the Diesel engine for yachts has been presented unfairly; namely, the high first cost. It is true that such engines are considerably more expensive than steam engines of the same horsepower. However, if an owner wishes a yacht with a certain amount of space for accommodations, a certain speed, and fuel capacity for a definite voyage he may find Diesel engines actually cheaper than steam, or, rather, that his yacht if fitted with these engines will cost him less than a yacht of the same characteristics propelled by steam engines. The steam yacht would have to be so much larger to carry the necessary fuel for the voyage, house the required crew, and allow space for the horsepower needed to drive the larger hull, that the first apparent saving by using steam engines would have disappeared.





Bow and stern view of twin screw yacht *Jezebel* in dry dock. She has ample displacement for comfortable ocean cruising.



A modern seagoing Diesel yacht, the *Jezebel*, owned by Thomas L. Chadbourne. Only 170 feet in length, she has unusually roomy accommodations.

An interesting comparison may be made between a seagoing Diesel yacht such as *Ohio*, approximately 163 feet on the waterline with a beam of 26 feet and a sea speed of 12 knots, these dimensions being about the minimum for extended offshore cruising, and a steam yacht of similar dimensions. Allowing sufficient fuel and storage space for only one-third the cruising radius of 10,000 miles in *Ohio* the steam yacht will have 10 per cent less space available for accommodations and will require four additional men

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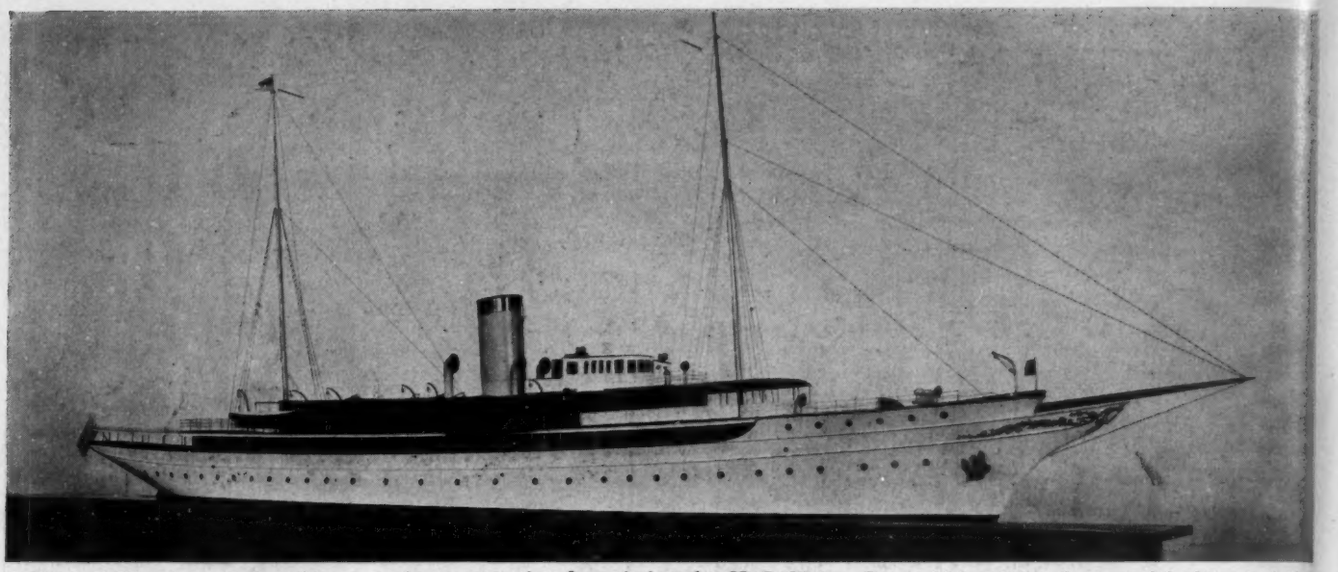


A 360-foot Diesel-powered yacht now under construction from designs by H. J. Gielow, Inc., which retains the graceful characteristics of the steam yacht.

The Development of Hull Design for Diesel Power

Changes in the Conventional Type Made Necessary by the Increasing Use of Diesel Engines

By W. Merton Rice

Vice President, H. J. Gielow, Inc.

With the general acceptance of the Diesel engine for marine purposes and the application of this type of power to yacht use, a great change has taken place during the past few years in the hull design of power-driven yachts. This has been so marked as to be almost revolutionary in certain phases, and the accepted yacht type, developed through fifty years, has been superseded by a hull form in which more attention has been paid to seaworthiness, wide cruising radius and greater ruggedness in design and construction. This resulted at first in the elimination of the purely ornamental features of the long overhangs and bowsprit, and the substitution of straight stems, short ends, greater beam and more displacement.

To my mind, one of the primary factors towards the development of the straight stem type of yacht was the tax question in the years following the war. During those days there was the 10 per cent luxury tax on all yacht construction, a yearly user's tax on the overall length of a yacht, which, with many other taxes on the individual's income, made it possible to effect quite a saving not only in the actual construction, but also in the upkeep and operation, by building the straight stem type of yacht rather than the clipper bowed. However, with the abolition of these taxes and the gradual easing up on income taxes, the clipper yacht is rightfully returning to its own, for it will always give the grace and beauty which is associated with a real yacht.

The plumb stem yacht has served a very useful purpose, but the trend in the design of the larger yachts today is again toward the clipper stem.

The question of the type of prime mover for a yacht is of the greatest importance both to the prospective owner and to the designer. The owner's requirements of type, whether for off shore cruising or coastwise, for high or moderate speed, and the amount and character of the accommodations desired all having been noted, the question of type of power plant has then to be decided.

In the decade before the present there was no question as to the power plant, as steam was supreme in its field, but the present-day owner has a number of types to choose from. He may still like to have steam aboard his ship. Therefore the propelling unit may be turbine drive, direct, or with reduction gears, or turbo-electric drive; or he may prefer the Diesel, in which case he has the choice of direct drive Diesel, the Diesel electric drive, or Diesel with reduction gears.

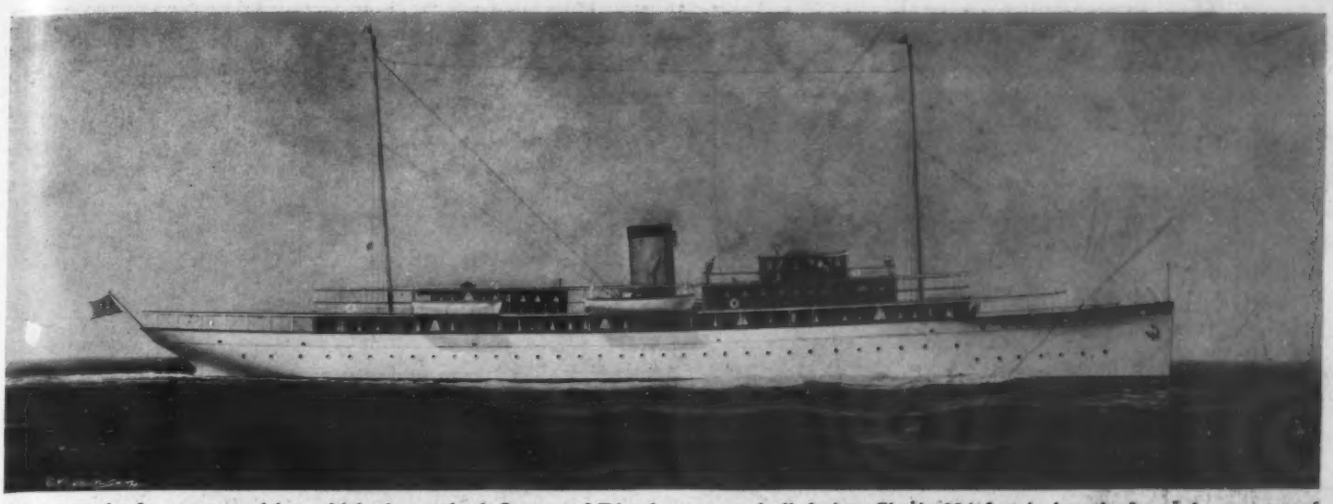
In making a comparison of steam versus the Diesel drive, there are a number of outstanding features in favor of the latter for yacht work.

First, there is a definite saving in the space required for a Diesel engine installation as against a steam installation, with its boiler rooms and fire rooms. This saving of space not only applies to the lower deck, but also to the main and upper decks, for it is necessary to provide on these decks space for uptakes, vents, etc., which take up considerable room and mean the elimination of many rooms which the owner could have were the Diesel plant installed.

A concrete example of this can be had in the comparison between the steam yacht *Nokomis II*, a clipper stem craft 243 feet in length, 32 foot beam and 12 foot 6 inch draft, and a Diesel yacht of the same dimensions.

Nokomis II, on her main deck, has 1520 square feet of available deck space for the owner's use, which may be divided into living room, dining room, owner's stateroom, lobbies, etc., whereas on a Diesel yacht of identically the same dimensions, by reason of the fact that there is not so much space required for engine room fidley, vents, uptakes, etc., the main deck space available for owner's quarters is 2160 square feet, which can be devoted to smoking room, living room, dining room, library, deck shelter and owner's stateroom. There is a distinct gain here of 640 square feet of deck space.

Naturally, in the Diesel plant there is a saving in weight of machinery which, on the same size yacht, gives

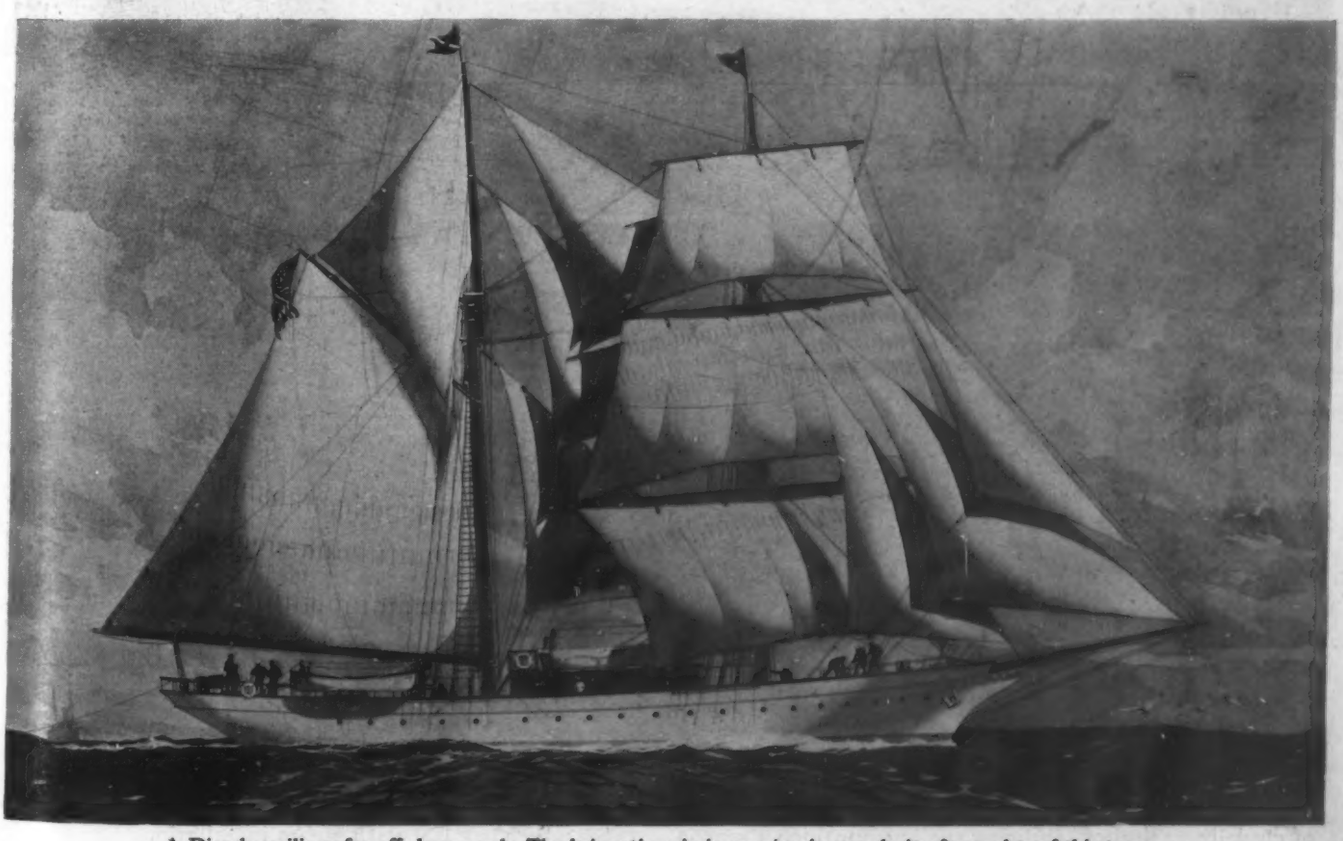


A large yacht for ocean cruising which shows the influence of Diesel power on hull design. She is 294 feet in length, from plans prepared by H. J. Gielow, Inc.

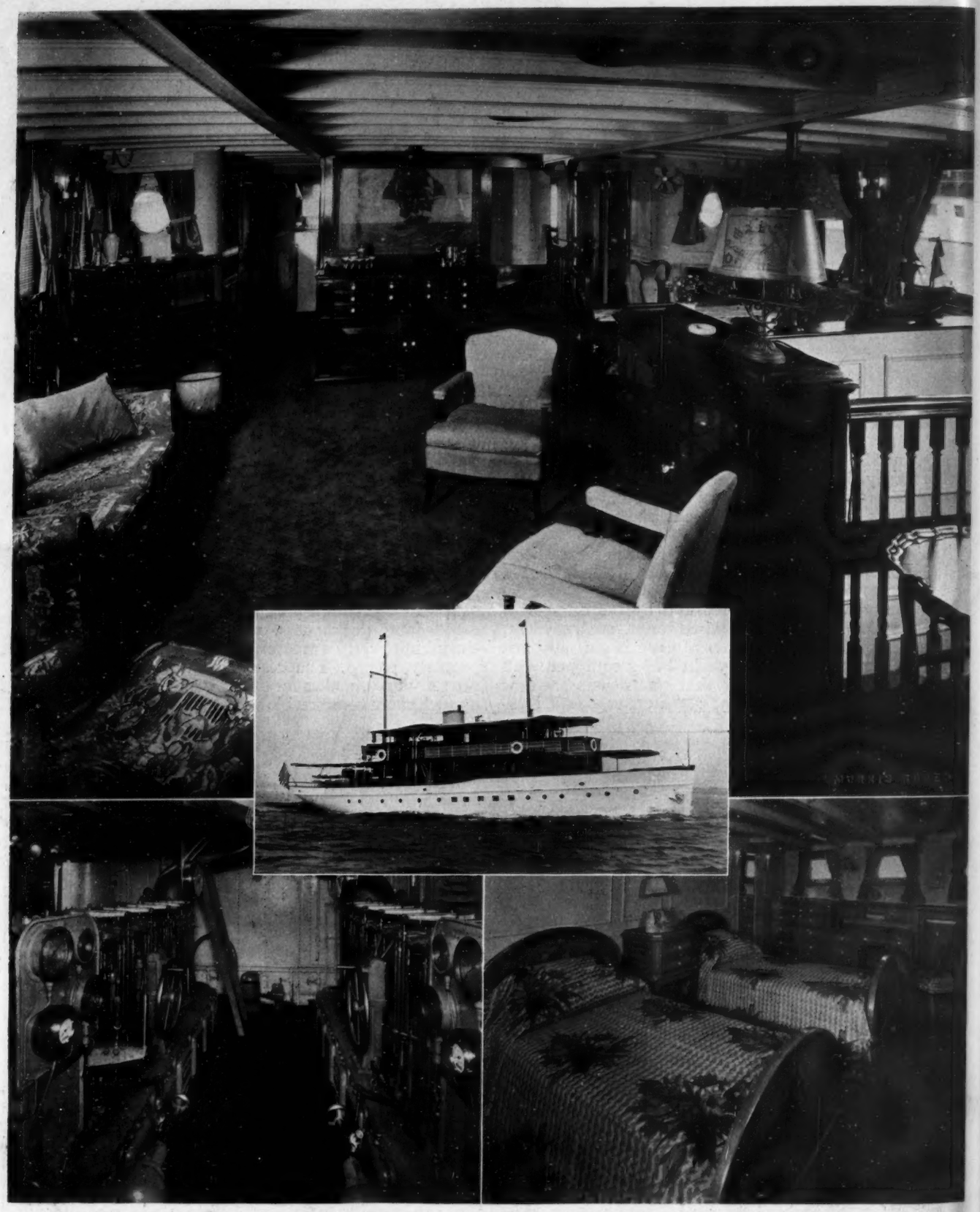
more displacement to use for the carrying of fuel oil and fresh water, which, of course, increases the cruising radius, in addition to the greater radius per pound of fuel given by the Diesel engine. In a given boat this gain in cruising radius with a Diesel engine amounts to as much as six times that of a steam plant of the same horsepower.

Again the fewer pipes, parts and fittings on a Diesel installation mean less upkeep, less chance of a breakdown, and reduces to a minimum chances of accident to the crew. The crew can also be reduced by the number of firemen which would be required on a steam yacht, although this saving in number of crew is partially lost owing to the modern Diesel yacht being equipped with so many electrical appliances that electricians are now required as part of the engine room crew. As an illustration, the electrical equipment on good sized yachts now runs from 250 to 300 k.w. of generator, in two or three units. The question of cleanliness is also a most important one, as in the Diesel installation there is no dirt or odor of any kind. Noise and vibration need not enter into a comparison of steam and Diesel equipped yachts. Neither are necessary in a well-designed yacht.

Due to the lower center of gravity of machinery there is a marked increase in the stability of Diesel yachts over steam yachts. This enables the designer to give the owner more deckhouses, more deck space, and allows the yacht to carry a greater number of boats and launches, properly placed. The result of the above advantage, properly used, makes for a better and drier sea boat and a much more comfortable vessel in a seaway.



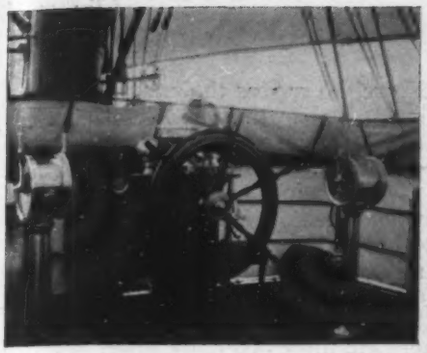
A Diesel auxiliary for off-shore work. The brigantine rig is growing in popularity for yachts of this type.



Alpha, a 100-foot Diesel yacht of the semi-houseboat type, designed by H. J. Gielow, Inc., for George Marshall Allen. Powered with two Bessemer engines.

Today, the modern yacht is becoming the all-year home of many owners, and is therefore being equipped for all ranges of temperature. Diesel yachts have the advantage of cleanliness and of requiring fueling but once a season.

In conclusion, it is evident that the Diesel engine can give the yacht owner most of the good features of the steam engine, and has besides many additional advantages which are lost with steam installation.



Diesel Electric Drive for Yachts

Bridge and fo'c'sle head of *Aloha*, Com. A. C. James, showing power control stand at right of wheel.

A Recent Development for Auxiliary Drive that Gives Bridge Control and Great Flexibility

By ARTHUR B. RAYMOND, M.E.

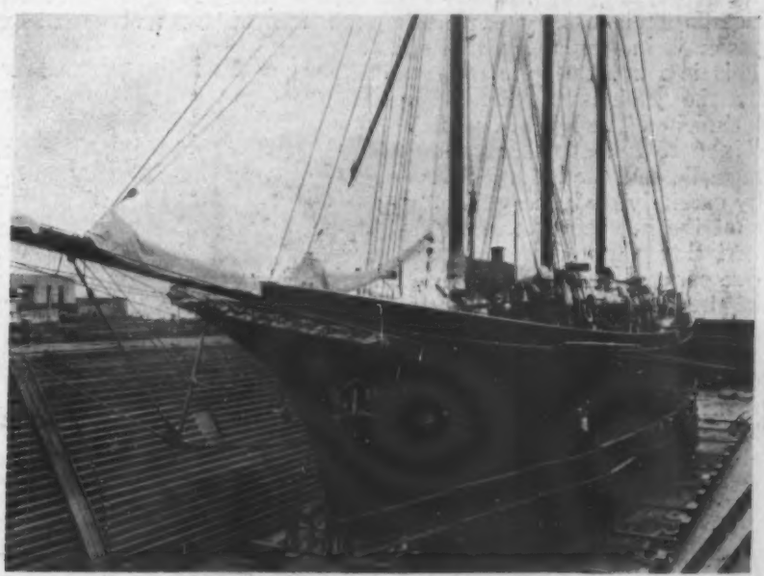
Associated with Tams & King

NEARLY forty years ago electrically propelled launches were built and used successfully, and during the Chicago World's Fair in 1893 a large fleet of electric launches was operated on the lagoons of the fair grounds. These were run by storage batteries and a central station for charging was connected with the storage basin where the launches were kept when not in service. Because of the weight of the storage batteries these launches were useful only on comparatively quiet water and their speed was very limited.

About this time the naphtha launch, the Alco-vapor launch and the steam launch were also in favor. Power boats over sixty or seventy feet in length were all steam equipped. Then came the development of the internal combustion gasoline engine and its application to marine use. A few installations of kerosene engines were made — some comparatively successful, others failures. Light weight, high pressure water tube boilers provided another forward step in the development of marine power and the combination of the gas producer and the internal combustion engine provided still another power unit.

In 1897 Dr. Rudolf Diesel, after four years of experimental work, completed his first commercially successful engine. During the world war the use of this type of internal combustion engine for marine purposes made rapid strides, especially in the case of submarines. It was for use in submarines that the Diesel electric type of propelling machinery was first developed. Shortly after the world war, the use of Diesel electric equipment was given consideration for other marine purposes. Steam electric propulsion was also developed, the U. S. Navy being among the pioneers in this work. The first yacht and commercial installations of the Diesel electric type were designed for the auxiliary schooner yacht *Guinevere* and for the trawler *Mariner*. While these were under construction a smaller unit was designed and installed in the schooner *Elfay*. During the past eight years this type of propulsion has become more and more popular and many installations have been made in ferry boats, tug boats, river craft, cargo and passenger vessels.

The theory of the Diesel electric drive is quite simple. One or more Diesel engines are directly connected to electric generators, and the electric power generated by these units is used to drive one or more electric motors, depending upon whether the vessel has one, two or three propellers. No storage batteries are used for propulsion, except in submarine work. The use of storage batteries is limited to auxiliaries, such as pumps, lighting, etc. The



Edgar Palmer's auxiliary schooner *Guinevere*, in drydock. She was one of the first yachts fitted with electric drive.

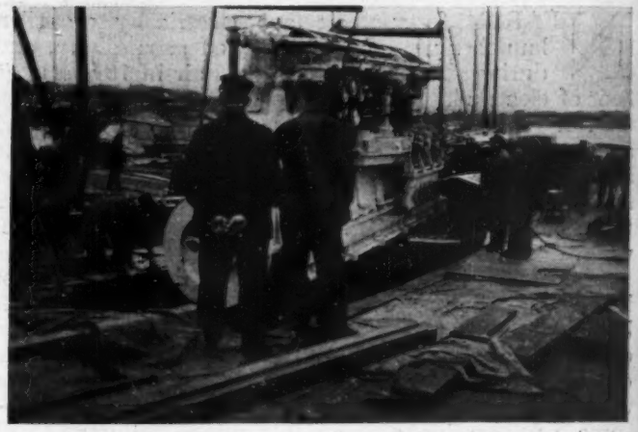
Wheel house of auxiliary schooner *Cutty Sark*, with full engine room control at right of wheel.

electric power is generated only as used for propulsion. Suppose we take the simplest form of Diesel electric installation and see just what is involved.

First we must have a Diesel engine and a generator, directly connected. Besides this we must have a small generator, usually about one-twentieth the power of the main generator, and known as an exciter. This furnishes electric current for the excitation of the field coils and plays an important part in the control system, manouvering, etc. In the first installations these exciters were driven from the main generator shaft by silent chains or belts but now their connection is usually direct. We must then have an electric motor connected to the propeller shaft. This may be located far away from the generating set and has no mechanical connection. The generating set and the propelling motor must be connected by electric cable. This is done by connecting the generator and the exciter by wires to a switchboard, and then running wires from the switchboard to the motor. The operation of the propelling unit then takes place at switchboard.

To get under way, the Diesel engine is started up and brought to its normal speed. This operation is similar to that of starting up an automobile engine before letting in the clutch. When the engine is idling in this way, you are not generating much electrical current, as the electrical installation is so designed that the generation of electrical power is in proportion to its use. This is a point seldom understood by the yachtsman who is not a technician. The Diesel engine is designed to run at a constant speed regardless of the load. This is done by carefully designed governors, so effective in their operation that a variation of not more than two to five per cent in speed of revolutions in the generating set will occur in going from no load to full load. When the signal to go ahead is given, the engineer turns a control lever or wheel in the go ahead direction and the boat moves ahead. The further he moves the lever, the faster ahead the boat goes. To stop, he moves the control lever back to the neutral position. To reverse, he moves the control lever in the opposite direction. All this time the Diesel generating set is running along in the same direction of rotation and at the same speed. So sensitive is this operation, that I have seen a 147-foot yacht moved one foot ahead and then one foot astern alongside of a dock where measurements could be made.

This simple controlling mechanism makes it possible to transfer easily the operation of the vessel to the deck or to the pilot house or bridge. In the most recent yacht installation, where there are three 300-horsepower generating sets and one double armature propelling motor; the starting and going to full speed ahead, and the stopping and reversing to full speed astern is controlled by one small lever on the bridge which moves only through an arc of about 160°, or about ten inches forward and ten inches backward. When handling the control from the bridge it is not necessary to have an engineer on watch in the engine room, once the proper switch hook-up has been made. Naturally, an engineer or oiler should make regular rounds to look after the oiling, etc. This simplicity



Lowering one of the two 6-cylinder Winton Diesel motors into *Guinevere*.

of control is one of the real advantages of the Diesel electric drive. The system used for control does not carry the main current and consequently no great bulk or weight of resistance is necessary. It has been known as the Ward-Leonard System and requires a D. C. installation.

Alternating current equipment has been proposed and tried but for marine purposes direct current equipment seems preferable. When the first Diesel electric installations were designed it was thought wise to keep to low voltages and 125- and 250-volt units were used. Now it is customary to use 500- and 600-volt circuits.

Very few yachtsmen realize the amount of auxiliary equipment that must be provided. A modern power yacht, in addition to its propelling machinery, must have a cold water, a hot water, and a sewage system; fire lines, lighting, heating, ventilating systems; cold storage machinery, windlass gear, steering gear, boat hoist gear, telephone system, annunciator system, searchlights, air or electric whistles, and numerous other mechanisms. In one recent installation there were 75 generators and motors of all sizes, and

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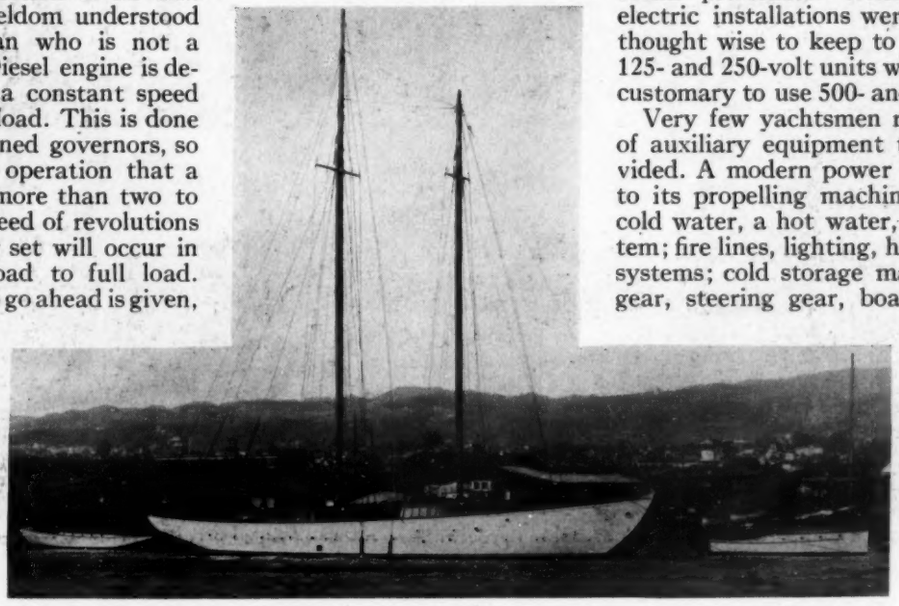
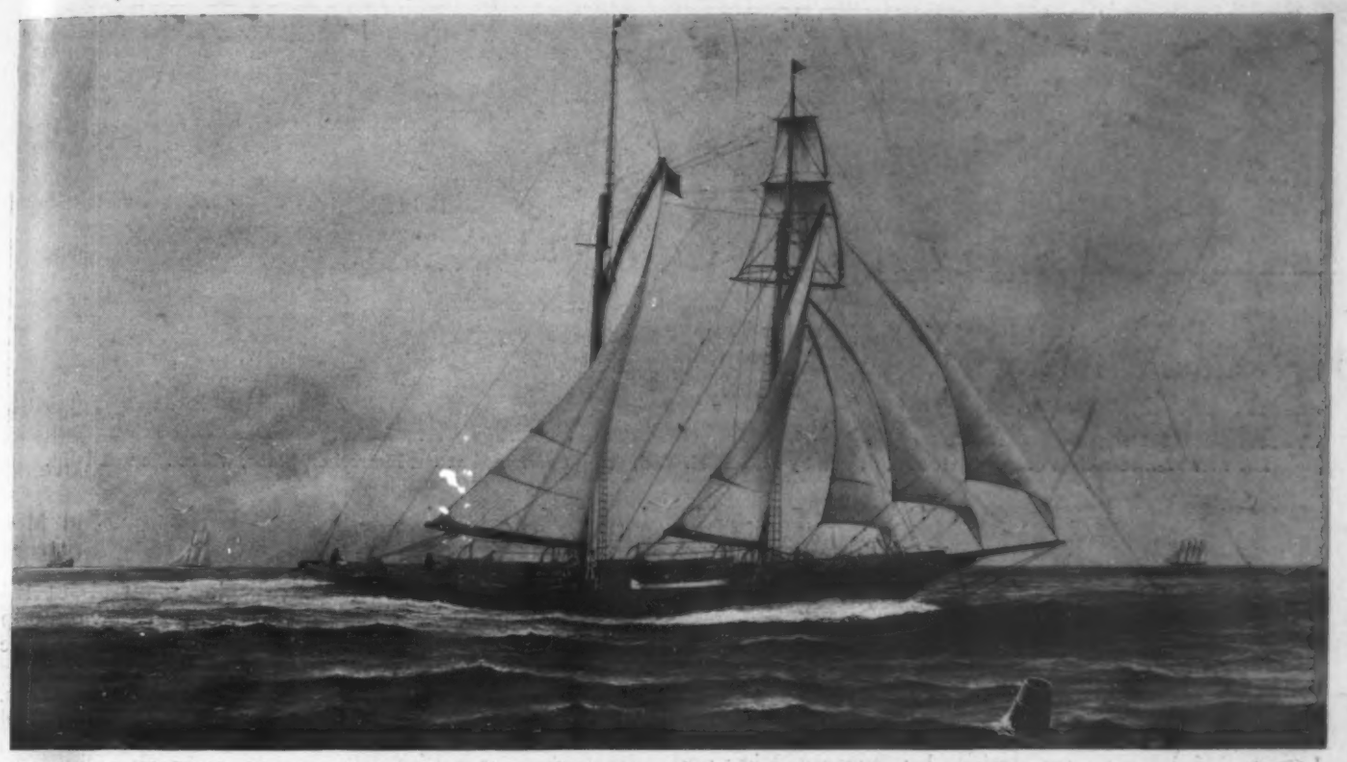


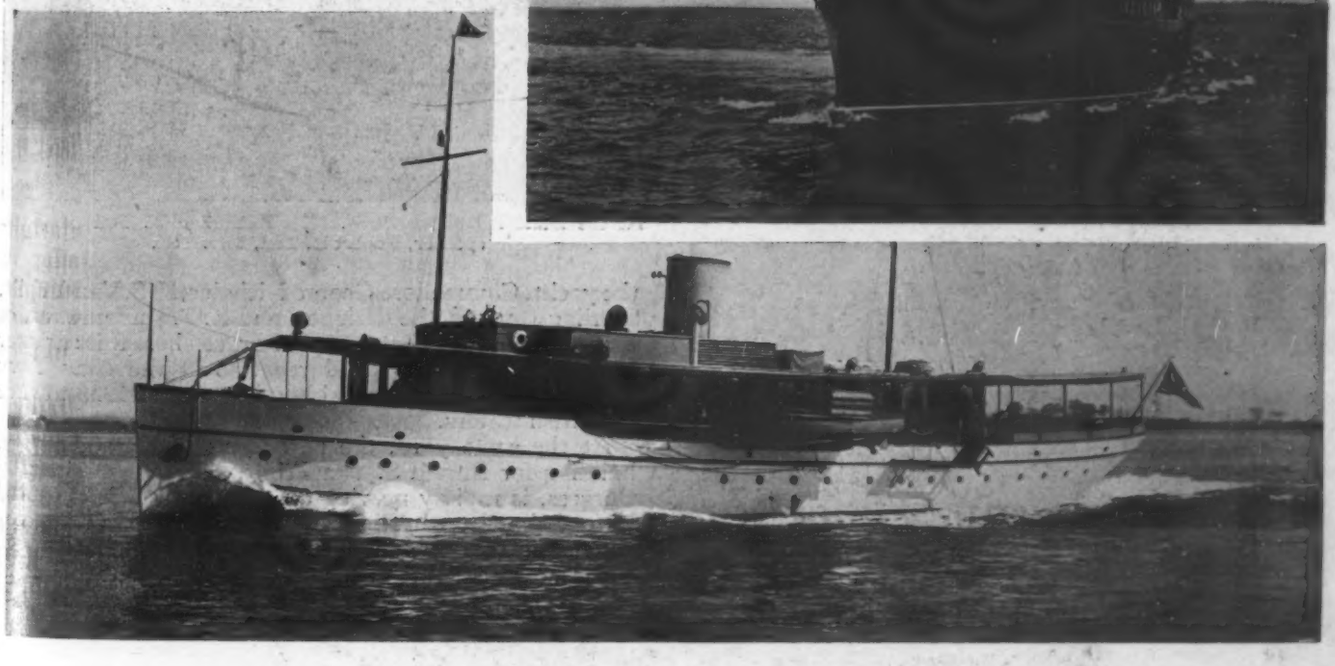
John Borden's new auxiliary schooner *Northern Light*, designed by H. C. Grebe Co., for Arctic exploration, and equipped with two 120 h.p. Fairbanks-Morse Diesels, with direct drive.

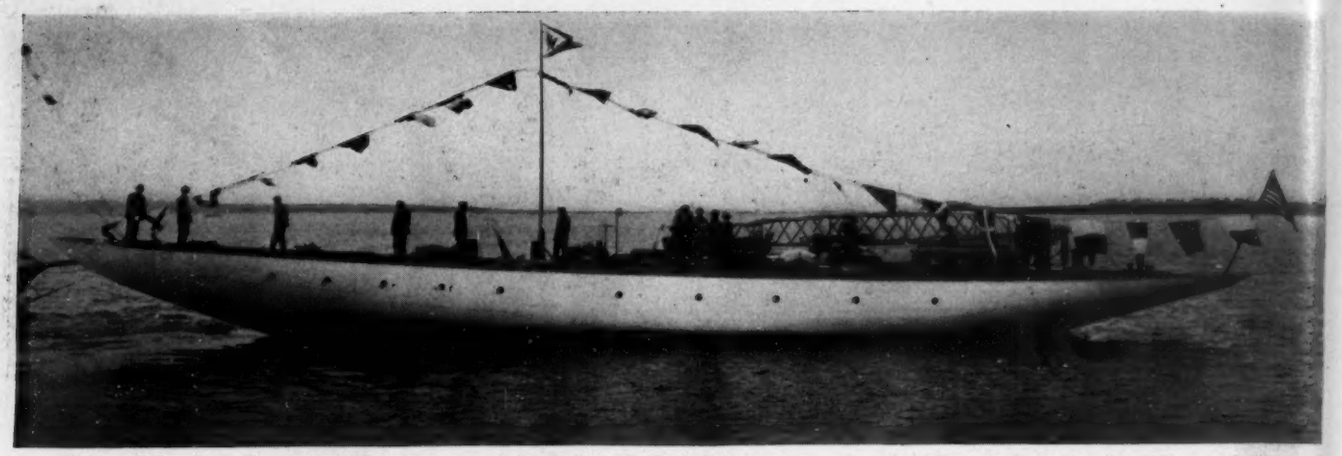


The square rig is coming back on yachts designed for ocean cruising. The new Diesel auxiliary topsail schooner *Cressida*, designed by Cox & Stevens for Hermann Oelrichs, of the New York Yacht Club. She is 172 feet in length over all, and is fitted with a 250 h.p. Diesel.

Sirocco, an excellent example of one of the smaller Diesel yachts. Although only 120 feet in length, she made a voyage to Europe and back last year in excellent time. Owned by Francis S. Whitten, she was designed and built by the Luders Marine Construction Co., and is powered with two Winton 6-cylinder Diesels.

Nevada, only 110 feet long, has proved a most successful Diesel yacht. Designed by Tams & King for DeVer H. Warner, two Standard Diesels give her unusual speed for her type.





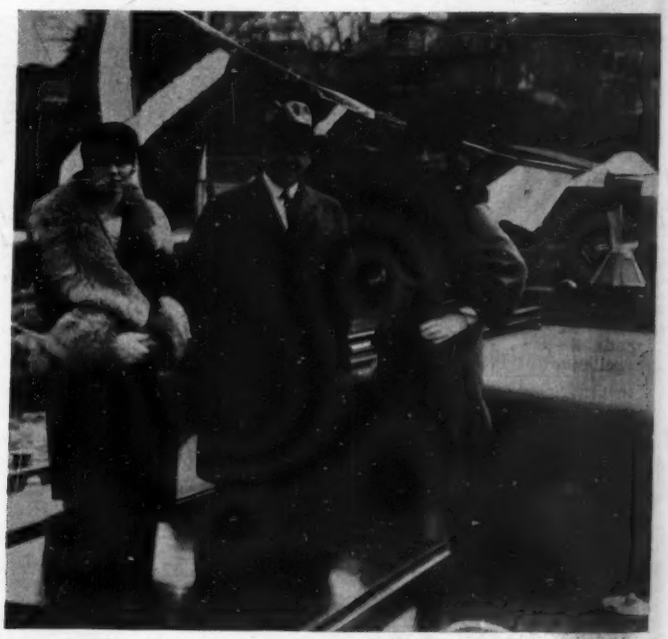
The new 23-meter class cutter *Katoura*, owned by Robert E. Tod, going overboard at the Herreshoff plant, where she was built.

The Month in Yachting

Katoura Goes Overboard

PERHAPS the most important launching of the new crop of yachts building for this season was that of Robert E. Tod's cutter *Katoura*, which went overboard from the yard of her builder, the Herreshoff Manufacturing Co., at Bristol, on May 2nd. This boat, built to the International Rule from designs by Burgess, Rigg and Morgan, is the largest racing yacht built in this country in over a decade. She is an exceedingly handsome craft, built of steel, and she will rate in the 23-meter class, her rating measurement figuring out just under 22 meters. Her dimensions are: length over all 112 feet; l. w. l. 75 feet; beam 20 feet; draft 13.6; displacement about 106 tons and sail area 7000 square feet. She has a built-up hollow mast whose truck towers some 150 feet above the water.

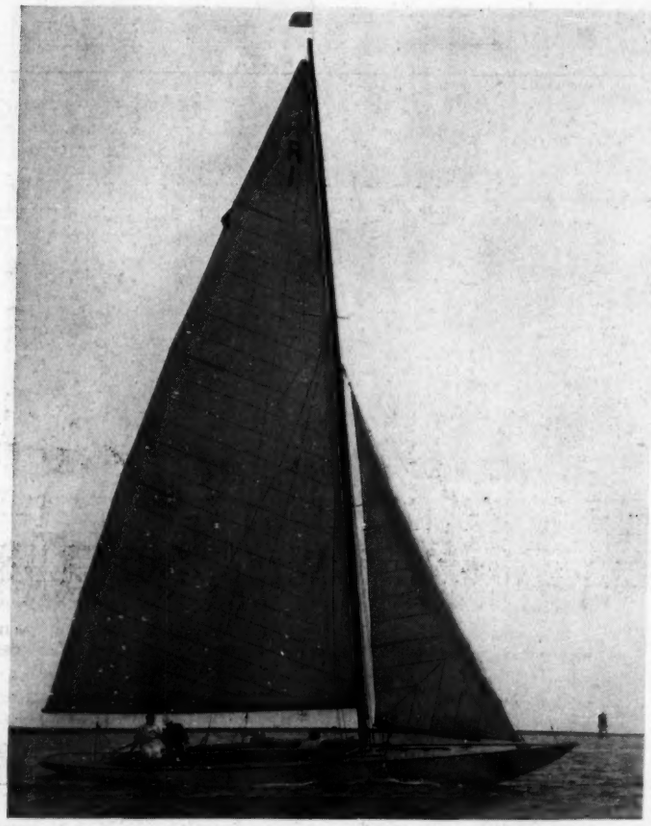
In the launching party were Commodore and Mrs. Robert E. Tod, Miss Katherine K. Tod, who christened



At the launching of *Katoura*. Miss Katherine K. Tod (left) the sponsor, Robert E. Tod, Mrs. Tod.

the yacht, Commodore George Nicholas, H. S. Vanderbilt, Starling Burgess, the designer, and R. F. Haffenreffer, of the Herreshoff Co. *Katoura* will be raced here this summer in the squadron runs and regattas of the New York Yacht Club and will probably go abroad in 1928 to race in British waters.

At the same yard, the new Class M sloop *Prestige*, building for Harold S. Vanderbilt, also from designs by Burgess, is rapidly nearing completion, and is expected to take the water by the end of May. She is built to the American Rule and is about 10 feet longer on top than the Fifties, against which she will race, her length being 82 feet over all, 54 feet on the water and 13 feet beam, or one foot and a half less than the Fifties.



Maribel, ex-*Alert III*, champion Class R, Southern California Yachting Association, now owned by Samuel Dauchy, of Chicago, and Lynn W. Browner. She was designed by C. D. Mower.

Launching of the new auxiliary ketch *Arbella*, at the Lawley Yard, Neponset. She is owned by Robert Saltonstall and was designed by J. G. Alden.

Ten-Meter Yachts Arrive

THE first eight of the fourteen new 10-meter yachts built for well-known Long Island Sound yachtsmen arrived at Halifax about May 15th from Bremen, where they were built, and were sailed to Marblehead by their owners, and thence to New York. They are exceedingly likely looking craft, with well-turned ends, good freeboard and a well-designed rig, the mast being about 75 feet in length. The first lot is expected to arrive on the Sound in time for the early June races, and the balance of the fourteen will follow them by about two weeks. The hull dimensions are: Length o. a. 58.8 feet; w. l. 36 feet; beam 10½ feet; draft 7.5 feet, sail area 1402 square feet. They are also of Burgess' design.

The names of the yachts, their racing numbers and owners are as follows, the first eight on the list being the ones that arrived in the first shipment:

Racing No.	Name	Owner
1.	*Twilight*	Clifford D. Mallory
2.	*Revenge*	Floyd L. Carlisle
3.	*Synthetic*	Henry L. Maxwell
4.	*Cythera*	W. A. W. Stewart
5.	*Valencia*	Carroll B. Alker
6.	*Narcissus*	Francis S. Page
7.	*Branta*	George G. Milne
8.	*Esquila*	John V. W. Reynders
9.	*Blazing Star*	Ernest G. Draper
10.	*Raeburn*	L. R. Wasey
11.	*Dragon*	Ralph Ellis
12.	*Redhead*	Philip R. Mallory
13.	*Shawara*	Harold Wesson
14.	*Nautilus*	James H. Ottley

A Six-Meter and Class R Mid-Winter Series for the Pacific Coast

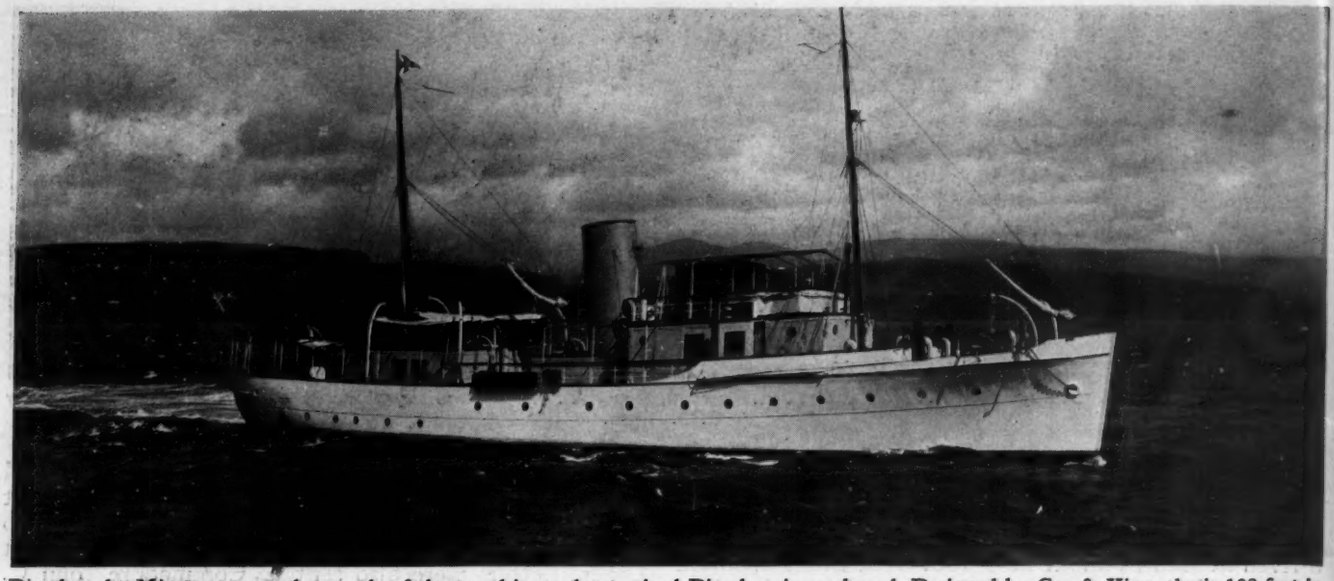
THROUGH the initiative of Clifford D. Mallory, President of the North American Yacht Racing Union, and the officers of the Skipper's Club, of Los Angeles, an intersectional series between the East and the West Coast yachtsmen will be sailed in Southern California waters next winter, and, as a result, the Pacific Coast is preparing to get together a six-meter fleet. The Seawanhaka, Indian Harbor and Larchmont Yacht Clubs will send "sixes" to the coast, and the Manhasset Bay Yacht Club is likely to send an R boat to meet the westerners. As a result the Skipper's Club is now making plans to build its first six-meter yacht, several prominent Southern California Corinthians are doing likewise, and San Diego, San Francisco, and Seattle yachtsmen have been invited to build "sixes."

Samuel Dauchy, of Chicago who, with Lynn Browner, owns the Southern California Yachting Association champion "R" sloop *Maribel*, ex-*Alert III*, was invited to sponsor the building of a six-meter sloop to represent San Diego, where he sails the *Maribel*. Mr. Dauchy also owns the twenty rater *Nancy*, which he sails on the Great Lakes. Letters were also sent to Commodore John C. Piver, of San Francisco, and to Seattle, inviting a six-meter representative from those yachting centers. The preliminary response has been encouraging, and in all probability the entire Coast will be represented.

One of the new 10-meter one-design class yachts for Long Island Sound, which were delivered last month. She is a likely looking craft.

At present there are two sixes in the Los Angeles fleet, the *Lady Betty*, owned by John Barneson, and *Smiles* owned by John C. Stick. Six-meter sloops have not been sailed as a class in Southern California, but have been racing in competition with "R" sloops.

The Midwinter regatta has definitely been placed on the program as an annual event, and Mr. Don Lee has offered a gold cup for next year's series. Commodore



Diesel yacht *Mingary*, a good example of the trend in moderate sized Diesel cruisers abroad. Designed by Cox & King, she is 123 feet in length.

Churchill is preparing invitations to be sent to every yacht club in the United States and Canada, asking for entries in an International Class R regatta, and the matter of Eastern entries has been referred to the new Class R Association, sponsored by Commodore Nichols of the New York Yacht Club, Charles A. Welsh of Boston, Robert Meyer of New York, Commodore Farley of Rochester, and James W. Alker, owner of the famous R sloop *Yankee*.

New Star Fleet on West Coast

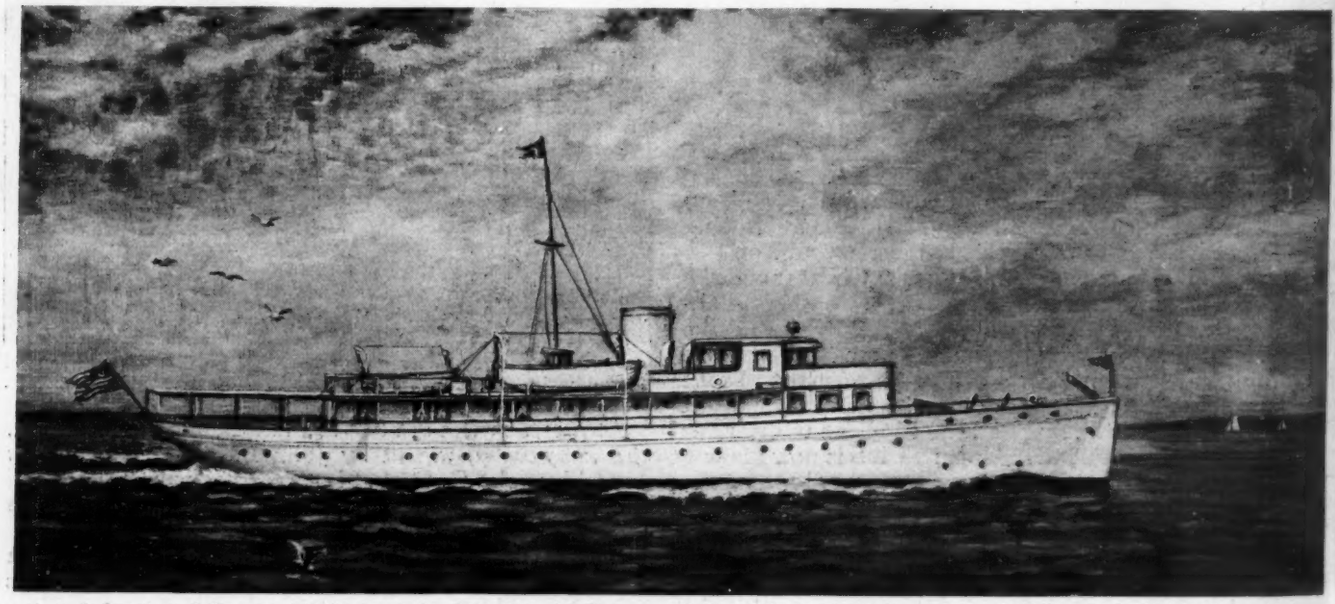
THE International Star Class Yacht Racing Association granted a charter last month to the Santa Barbara Channel Fleet, making the 33rd fleet enrolled in the Association. There is now no harbor along the Pacific Coast of North America, except possibly some outlying districts below the Mexican border, where there are not Stars racing. Challenges are already coming in for the Star Class International Series, to be sailed this year on Narragansett Bay, Aug. 29th to Sept. 3rd.

First New England Launchings of the Season

THE first launchings of the 1927 fleet of new yachts built during the winter in New England yards took place in April. On the 6th the handsome power cruiser *Harriet*, built at the yard of F. D. Lawley, Inc., for Charles H. Jones, of the Eastern Yacht Club, took her initial plunge into the waters of the Town River in Quincy, Mass. On the 18th the handsome 73-foot auxiliary ketch designed by John G. Alden for Robert L. Saltonstall, of Boston, was launched at the yard of the George Lawley and Son Corporation, in Neponset. Another launching took place at Lawson's yard in Dorchester, where the 35-foot auxiliary ketch *Houqua* slid down the ways. This boat is owned by Alexander W. Moffat, of the Cruising Club of America.

Arbella, the name of the Saltonstall ketch, perpetuates the memory of a famous ship that formerly made record passages across the Western Ocean. The yacht is a

(*Continued on page 100*)



A drawing of the new 140-foot seagoing Diesel yacht *Comoco*, designed by J. H. Wells and now building for R. W. Judson.

Photos by M. Rosenfeld

The express runabouts furnish the best of racing when matched against their own type. A class of one-design Chris-Craft, all with 150 h.p. Kermath engines, starting in a regatta at Detroit.

What the Stock Runabout Has Done for Motor Boat Racing

The Sport No Longer Confined to Specially Designed, Temperamental, Costly Craft

By HERBERT L. STONE

UP to within a few years, motor boat racing worthy of the name and fast enough to provide any thrills for competitors or spectators, was a sport for the rich alone. To be successful meant a specially designed hull, the best engine money could buy (often with special features incorporated), and plenty of time and a large enough bank account for experiments and changes, with a well-equipped machine shop always at hand. It was a game that appealed to many, but which only a few could afford.

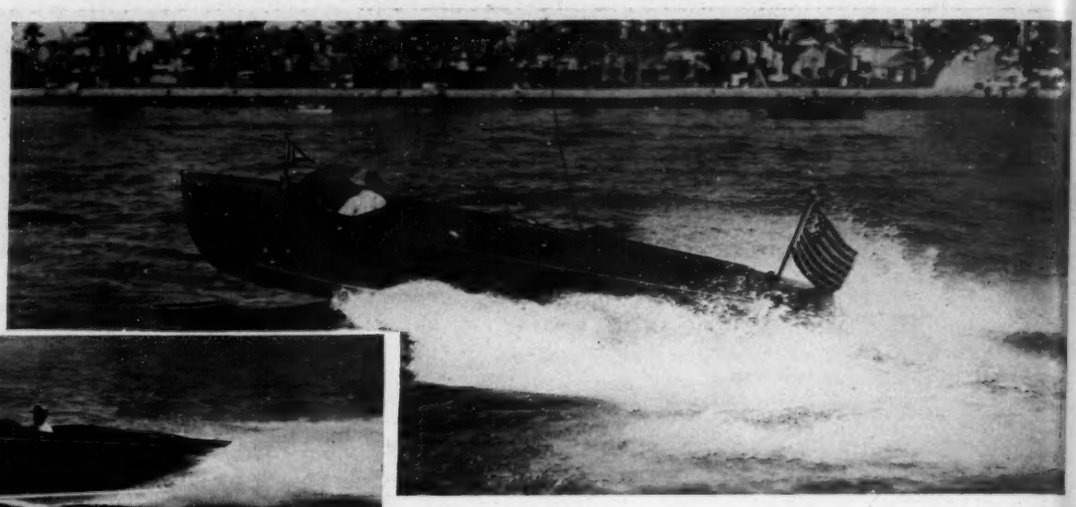
But such racing served its purpose, for it not only attracted attention to the possibilities of the sport, but it served to develop both hull and power plant to the present high state of perfection and reliability, and it brought the fast runabout, with speeds never before thought possible, within the reach of thousands who have the means to gratify their sporting instinct.

One has only to recall the early years of racing in this country, when speeds of 30 miles an hour were considered the maximum, and craft of weird design were scattered around every racing course like a squadron of sub-chasers in a gale of wind during the late unpleasantness with the Central Powers, to see the strides that have been made. Even today, in the highly specialized racing classes, such as the Gold Cup, Dodge Trophy and other events, there is a surprising amount of "mortality" in the large fleets that start; and in these races many who spend large sums on their outfits never get a run for their money. After a

Rough water never stops the Sea Sleds from racing.

Right: A 26-foot Dodge Watercar makes a fine boat for a one-design racing class, with a speed of 33 miles per hour.

Below: A Dart runabout, powered with a 150 h.p. motor, racing in the Express Runabout class at Miami.



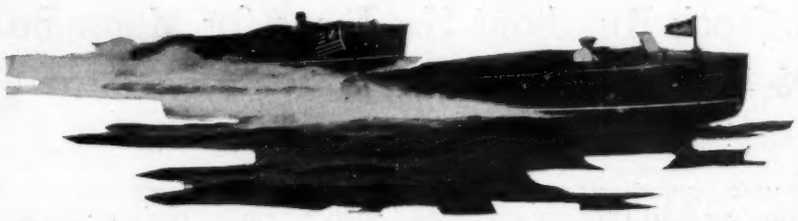
season spent in preparation, an owner will frequently not be able to complete one lap of the course, and sometimes not even to start.

But for the man who wants real sport, with the assurance that his boat will go out and run at any time and will have a chance to annex some of the silverware, the restricted classes of stock runabouts offer him the first real opportunity to get into the game at a price that he can afford.

The small restricted classes, such as the 151-class of hydroplanes, was the first step in this direction. It did, and is still doing, a lot for racing. Then came the standardized boats with speeds from 30 to 40 miles per hour — which, by the way, is plenty fast enough for thrills — and with a number of these in one locality, a racing class could always be counted on to fill.

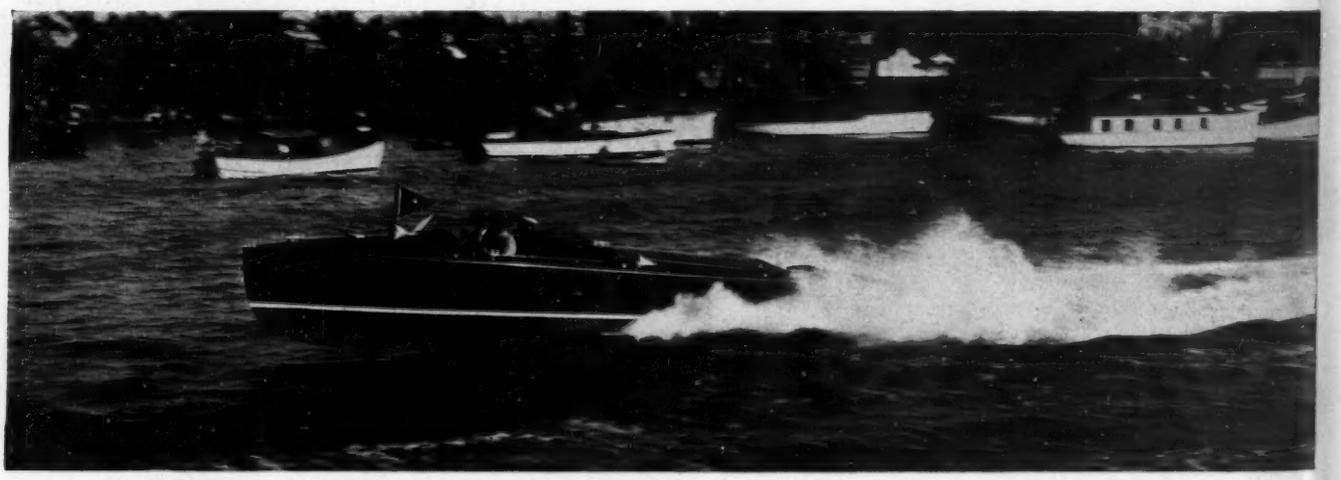
The big motor boat regatta at Detroit was the first to stage one of these races for standard makes of runabouts, when a class was provided for stock 26-foot Chris-Craft, and no less than 22 of these fast boats competed in a 15-mile race that resulted in furious brushes on the turns and straightaways and the closest of finishes. This showed the real sporting possibilities in such racing.

Regatta committees straightway made classes for other stock runabouts of high speed, such as Bear-Cats, Baby Gars and the like, and, more frequently, for all stock runabouts of any make with a certain over all length and cylinder volume, or power limit, so that boats of the same relative size and horsepower might race together. Thus the most popular races at any of the big motor boat meets of this year will be those of the restricted express cruiser classes, such as the 26-foot, 150 h.p. class. These classes will give owners of such boats as the standard Dodge Watercars, Chris-Craft, Darts, Baby Gars, Sea Sleds, and many other makes, a chance to show what they can do in cutting around a buoy on the inside at a congested turn, and in filling their sideboards with silverware, all at a very moderate cost.



The closest racing is always between one-design stock express runabouts. Two 26-foot Baby Gar Jr.'s, powered with 150 h.p. Scripps.

And in talking of stock boat racing one must not forget the outboards, and the sport they are furnishing. Speeds up to 25 or more miles per hour in a light craft from 14 to 18 feet in length furnish real racing. If you don't believe it, ask the man who drives one. Yes, the standardized boat promises to make motor boat racing a real sport — and not a gamble.



For higher speeds of 40 miles per hour upwards, the Super Bear Cats, with 200 h.p. Hall-Scotts, furnish great racing.

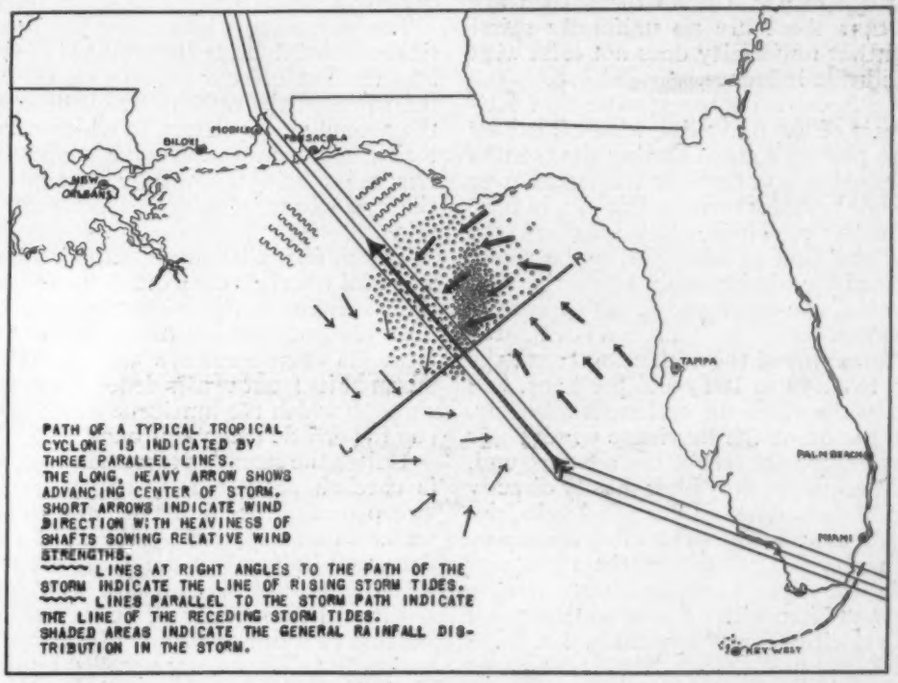
Grim Forces Charted in Tropical Cyclones

A New Theory of the Laws Governing Hurricanes that Will Be of Value to Yachtsmen

By Charles Camp Cantrell

HE'S a lucky yachtsman who has never had his hair pulled by the hurricane winds of a tropical cyclone. He's a lucky yachtsman indeed, for hurricanes have a habit of pulling the hair of deepwater sailormen and landsmen alike. They roll along, these hurricanes, to scourge the seas and destroy man's handiwork afloat and ashore. Even the fairest of fair weather sailors must face the tug of insane winds, if only from the shelter of a landlubber's haven. There is many a one of these who has paid, in anguish and injury, not to speak of tragedy, his toll into the maw of the storm demon.

Spawned above the innocent blue of the Caribbean, tropical hurricanes have their origins near the equator and pursue catastrophic courses across the face of the earth, for longer or shorter distances, until, for one reason or another, they die out and leave terror stricken folk to count the cost. Typhoons and West India hurricanes are blood kin, raging ogres whose conduct has been the more awful because of the little that has been known concerning their movements and the laws governing them.


BILOXI
PENSACOLA
NEW ORLEANS
TAMPA
PALM BEACH
MIAMI
KEY WEST
PATH OF A TYPICAL TROPICAL CYCLONE IS INDICATED BY THREE PARALLEL LINES.
THE LONG, HEAVY ARROW SHOWS ADVANCING CENTER OF STORM.
SHORT ARROWS INDICATE WIND DIRECTION WITH HEAVINESS OF SHAFTS SOWING RELATIVE WIND STRENGTHS.
LINES AT RIGHT ANGLES TO THE PATH OF THE STORM INDICATE THE LINE OF RISING STORM TIDES.
LINES PARALLEL TO THE STORM PATH INDICATE THE LINE OF THE RECEDING STORM TIDES.
SHADED AREAS INDICATE THE GENERAL RAINFALL DISTRIBUTION IN THE STORM.

Diagram, drawn from Dr. Cline's findings, of the action of the winds in the four quadrants of a hurricane, and the tidal action preceding it.

But the day has gone when human beings susceptible to tropical cyclones must sit in terror before the advance, or need flee desperately to escape the path of the storm. Tropical hurricanes will continue to be generated from year to year in the lower latitudes, and will hurl at the American coast-line the same forces as in the past. But since we now know the nature of these beasts of the winds, mankind may protect against those forces with reasonable confidence that the assaults will be withstood.

For nearly half a century Dr. Isaac M. Cline, the Weather Bureau's senior meteorologist, has been studying winds and cyclones. For thirty years he has been stationed in the very "heart of the cyclone belt." He has felt the full force of these storms and the stark finger of Death has pointed at him from behind the cloak of the winds. But he has never blinked an eye and he has continued his studies — in the face of popular apathy and scientific skepticism — until he has learned what they are, what makes them go, what they can do and, generally, how they act.

The publication of his findings, made with departmental sanction from Washington,* has shattered the old text-book idealizations of storms and has blasted the old "spinning doughnut" and "dumb-bell vortex" conceptions.

For the purposes of this article, a tropical cyclone may be defined as an atmospheric disturbance which originates in, or near the West Indies, and moves generally northwestward to strike the American coast between Yucatan and Cape Cod. Most frequently, such cyclones, or hurricanes, strike between Tampico and Charleston, but they are by no means confined to such a limitation.

For longer than they should be willing to admit, the text-book writers regularly reaffirmed the essentials of the first idealizations about hurricane cyclones. These — all of them enunciated prior to Cline's discoveries — may be summed up in the following words: "Tropical cyclones were seen as hurricanes of circular outline at the surface within which winds blew counter clockwise and spirally inward toward the center of the storm; that vertically these storms tended toward a dumb-bell vortex so that there was a resulting spiral radial outflow of cirrus clouds in the upper air over the disturbance."

Many other things were taught in detail and probably still are in some cases, but they all went back to the basis of the old idealization.

Dr. Cline, from his work in Galveston and New Orleans, believes these teachings to be false and based upon simple lack of knowledge. With the findings of his storm studies engineers may now build harbors, buildings and public works in proper economy and adequate to withstand the forces of tropical cyclones. Navigators may take this new knowledge and use it for the protection of their craft and themselves.

A yachtsman might as well lose his boat upon a charted reef as to see it splintered by a tidal wave sweeping in the storm's advance over his anchorage. Cline has charted the cyclone in such a way that only the careless will be unprepared for future hurricanes. The practical value of this new knowledge was illustrated recently during a conversation between the writer and a master mariner whose ship, a well-known intermediate liner, was severely shaken at Havana during the passage of the September, 1926, hurricane which swept up across the Isle of Pines. The captain had just read Dr. Cline's findings.

"Oh, man, if I'd only known this before that storm,"

* *Tropical Cyclones.* Isaac Monroe Cline, MacMillan's.

he said. "I'd not have lost ten years of my life. Dancing ships, tossed by that storm, were all about me in the bay there at Havana. My propeller was fouled, my anchor chains were fouled, and a drifting ship fouled even my bridge, taking away the engine room telegraphs. I had anchored, rather than go out, when that storm was reported coming up. If I had just known what a hurricane really does inside itself, I had enough other information to tell me to put to sea and run out of the worst of the blow, with plenty of sea room for a comfortable course."

What people have been taught previously apparently does not happen in the body of a hurricane.

Cline has found that, while generally circular in area, the cyclone naturally divides itself into four parts by two diameters; one coincident with the path of the traveling storm center, and the other diameter at right angles, through the center of the path. Within the storm the action of the winds and the rainfall is distinctly different in the respective quadrants marked by the two diameters. The significant features of Dr. Cline's discoveries are those which show that there are no uniformly spiral incurving winds and that uniformity does not exist with respect to rainfall and tide influence.

The tropical storm is carried into extra-tropical latitudes by the air stream of the prevailing winds. That air stream is the storm's plotted course. During the months of July, August, September and October the trades over the West Indies are not northeast winds, but are, in fact, easterly and southeasterly. Their extensions are the monsoonal winds of the Gulf of Mexico. As the storm moves within the prevailing wind current, generating and developing its own area, the hurricane winds within the storm play distinct rôles.

In the right rear quadrant of the advancing storm the winds blow fiercely, from 40 to 100 miles per hour, and directly in the direction in which the cyclone is traveling.

In the right front quadrant the hurricane winds show variable inclinations toward the left of the advance and, near the quadrantal periphery, they blow mostly directly across the projected line of advance. The wind velocities are greater in the right than in the left half of the storm. The greatest sustained velocities are in the right rear quadrant though in the right front quadrant terrible blasts, intermittent, and often with a lifting tendency, are noted. Often these velocities range upward of 100 miles per hour.

In the left front quadrant, as the cyclone moves, the winds begin to diminish in force and tend backwards toward the lateral diameter of the storm area. They blow in almost direct opposition to the winds in the right rear quadrant but with lowered velocities.

In the left rear quadrant the diminishing winds curve sharply toward the longitudinal diameter and cross the path to merge with the high sustained winds of the right rear quadrant and reassume a part in the continuing generation of the storm.

Ferrell, years ago, called attention to the fact that the trades do not prevail from the northeast in all regions in which they are supposed to blow. He is, perhaps, the first to write his observations of this fact and to point out that the prevailing winds over the West Indies and the Caribbean Sea are from the east and the southeast. These, and the Gulf monsoonals, generally move from eight to sixteen miles an hour and govern the speed at which the tropical cyclone travels in the tropics and into extra-tropical regions. The influence on the traveling storm of upper air currents and opposing air currents is witnessed when the storm changes direction, or slows down, or dies out at sea.

The records show that tropical cyclones moving toward the Gulf and Atlantic coasts have nearly circular isobars, low barometer and a calm, or little wind, at the center. Cline declares that the birth of cyclones may be brought about "by large air currents running into the doldrums, the convergence of countercurrents on the border of the trade winds, or currents moving at different velocities in the same direction and which develop ascending air streams."

When there is convergence of air currents and the resultant ascent of air, causing the water vapor to be condensed and precipitated, latent heat is liberated by the process, to intensify the rarefaction of the air over the area of condensation. This causes a movement of air into that area (the right front quadrant) from such directions as it may come (which is from the right rear quadrant). When this reaches a sufficient distance from the equator the deflective force of the earth's rotation acts on the inflowing air and the cyclonic development is set in action. Once this cyclonic movement is started, the air current in which it travels will continue it, even after the primary cause has ceased to exist.

The prevailing winds carry the newly developed hurricane forward, bring the winds of the right rear quadrant into the line of advance so that their convergence with the winds in the right front quadrant continue to create the ascending air stream in which condensation, precipitation and convection take place. The ascending air stream is carried forward by momentum into the front of the cyclonic area, which is the part marked by heavy rains.

The moisture-laden air, supplied by the more regular winds of the right rear quadrant following the "pull" of the ascending air, provides the water vapor for continuance of condensation, precipitation and convection, the elements of the storm's energy. The resistance to the storm at its front causes deflection further to the left half, through which the hurricane winds diminish as they pursue the erratic merry-go-round.

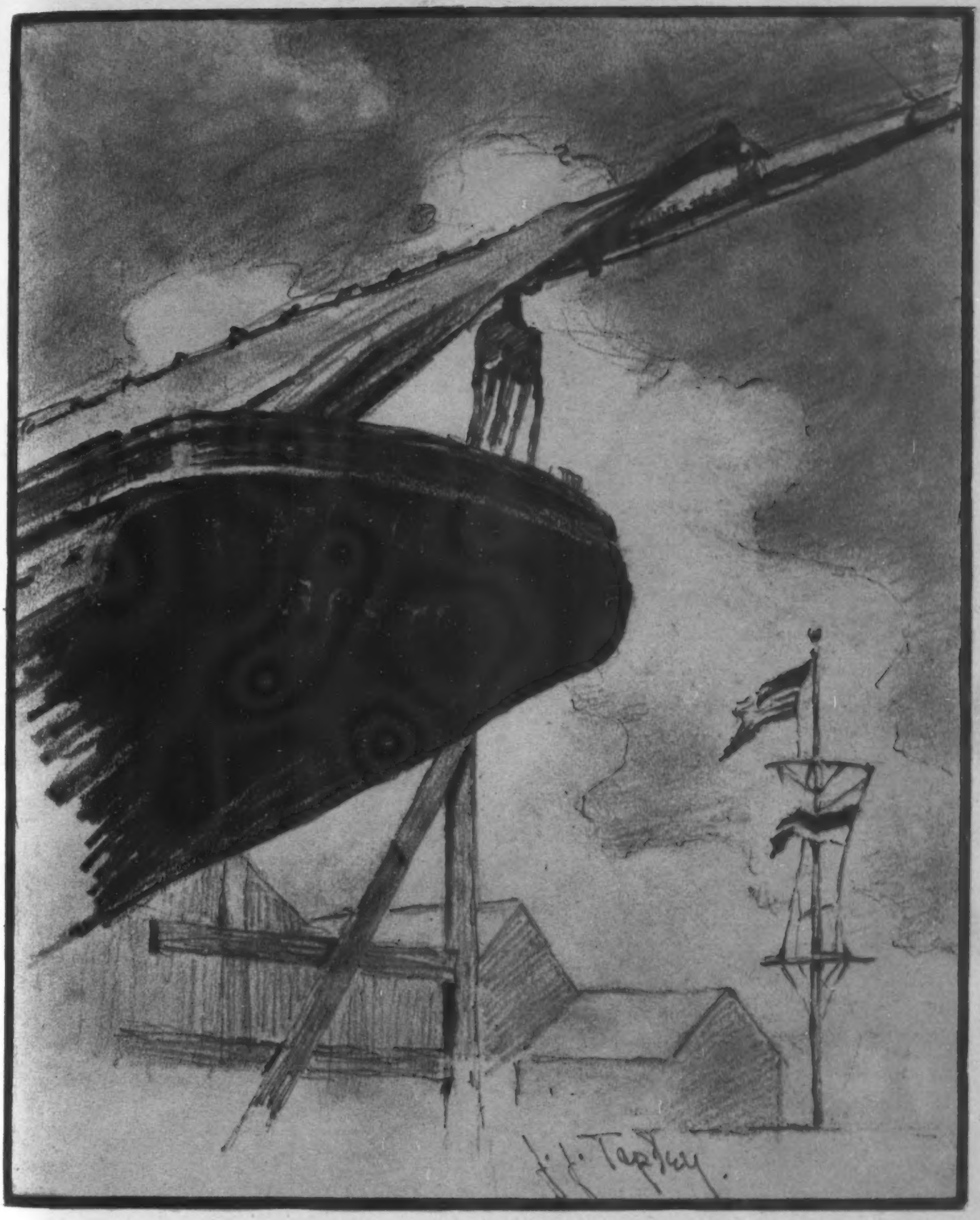
Unless the storm's progress in the prevailing air stream is checked or halted by opposing air currents, it will sweep across the land until the diminished content of water vapor supplied by the right rear quadrant winds decreases its force to the dying point. If halted, it soon loses form and "blows itself out."

From the above it will be seen that the previous conception of a center release of the storm energy is a misconception. The energy supplied by the condensation and precipitation of moisture, and the release of latent heat in the ascending air stream in front of the cyclonic area, does not of itself carry the storm along, but it does determine the cyclone's pressure minimum, the steepness of the barometric gradients and the wind velocities in the cyclone — that is to say, the destructive forces of the storm.

Coastal residents, and yacht owners in particular, have in years past been appalled by the terrible onward sweep of what is commonly called "a tidal wave," an overwhelming rush of water well in advance of the hurricane's striking. The coming of the storm winds is something people of the coastal regions are pretty well prepared for through broadcast warnings issued by the Weather Bureau. A sudden, and to them unprecedented, "tidal wave" is worse than insult added to injury when contemplated after the passage of the cyclone.

For thirty-six hours, more or less, in front of an ordinary full grown cyclone's advance, the winds of its right rear quadrant are busy generating a storm swell which outruns the storm area, passing through the gusty quadrant on the right front, to drive forward along the storm's path, ahead of and in the right of it. These storm waves harmonize with the waves caused by the prevailing winds, but they do not lose their individuality. At sea, in front

(*Continued on page 96*)



ALONG THE GLOUCESTER WATERFRONT.

Fishing schooner *Mayflower* on the ways. She never got a chance to measure speed with the Nova Scotian fishermen.

PASSING A HOMEWARD-BOUNDER

From a wash drawing by Charles Rosner of life on a windjammer.

"The foretopmast had already gone out of her, its head wrung off by the tug of the balloon." The gang getting in the thrashing sail, from a snapshot on board the *Henry Ford* by the writer.

Those Fishermen

By C. H. J. Snider

An "Idler" on Board the Fishing Schooners "Bluenose," "Mahaska," "Haligonian," "Henry Ford," and "Columbia," in Various Races During the Last Six Years

THERE they dip and dance on the heaving Atlantic swell, shining beauties with sheer lines springy as a drawn bow, eight working sails, and topmast trucks 130 feet above the water — "big stuff" in the eyes of the yachtsman who has to content himself with a 40-foot spar spreading jib and mainsail, and a spinnaker for good measure.

If you step out of a 20-rater or 6-meter, or something of that sort, you will be staggered by the size of the crew of a racing fisherman; twenty-nine hands in all, besides observer and pilot. What can all these men find to do? you feel like asking. Just wait.

Talk about light sails. The gaff topsails have been sent to the sail-loft for recutting, and a "hand or two" have gone to bring them back. Here they come down the fish wharf — five men under each stopped-up topsail, and each has a full back-load! It takes twenty men, heaving with shoulder and handspike, to bundle that mainsail of No. 1 canvas up on to the 80-foot boom when it has to be furled. There's near 150 fathoms of rope to overhaul in the mainsheet and its jig. As for mastheading the mainsail, with its 50-foot gaff — here's where the brawn and muscle of all hands and the cook are needed. But up those big sails go *by hand*, for at race time the schooners often shed their handy gasoline winches to save weight on deck.

A fine thing it is to see and hear twenty or thirty strong young fellows swaying up throat and peak while the chantyman livens them with:

"O Whiskey is the life of man!"

Some of them are old enough to remember the meaning of the word, and they chorus:

"Whiskey, Johnny!"

He comes back with:

"O Whiskey in an old tin can!"

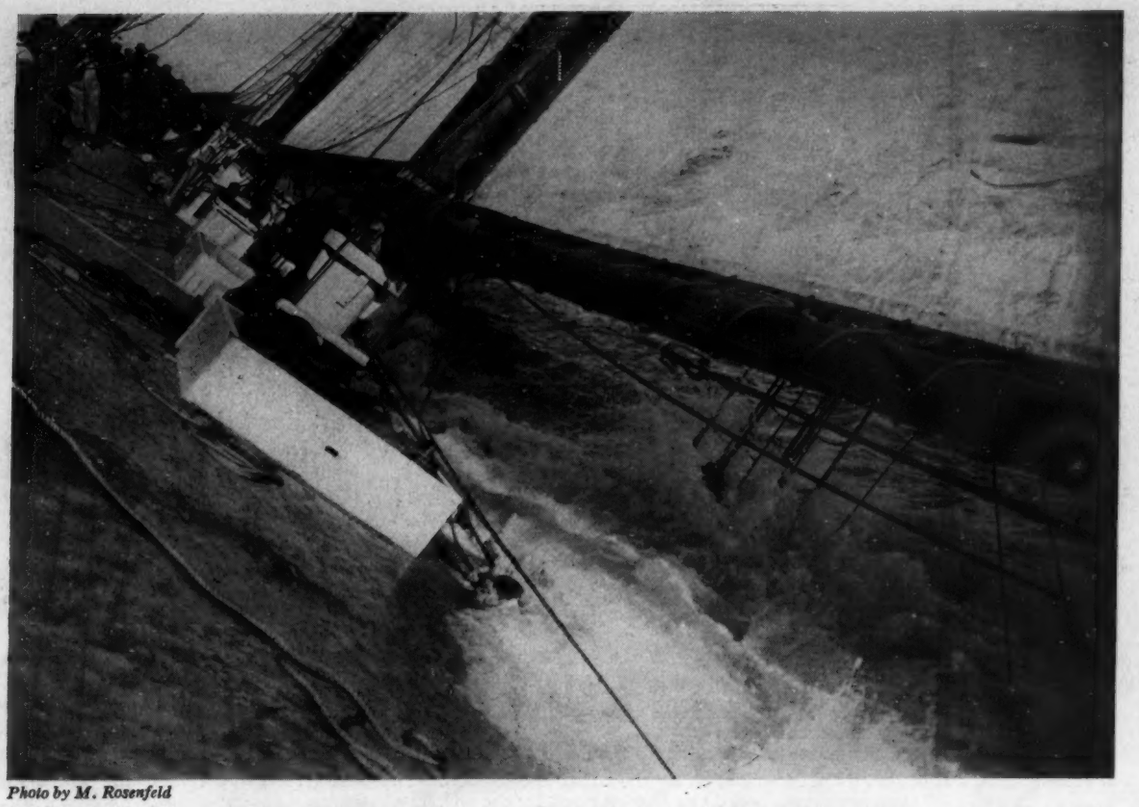
And they cap it with:

"Whiskey for my Johnny!"

Most dramatic bit of canvas-setting I have witnessed was in Gloucester, in 1922, when that lean rangy racing skipper, "Clayt" Morrissey, tossed the ends of the throat and peak halliards of the *Henry Ford* on to the dock and hundreds of willing helpers ran up town with them, the mainsail rising as if by magic, till the throat halliards were two blocks, the peak up-ended like a sliding gunter, and the great boom high off the saddle and high above Captain Morrissey's six-foot-something skypiece.

With such canvas to handle the wonder is that fishermen do not race with larger crews. True, they fish with from twenty to twenty-five men, but most of the time then they are under half sail, and they have always all the Atlantic to wrestle in. Yachting restrictions vary, but one man is usually allowed for each 250 square feet of sail area in a racing yacht. With their 10,000-foot sail spread, these fishing schooners would, on these terms, be entitled to use crews of forty men. And look at the 70-men crews of some of the America Cup defenders of 90-foot waterline, 20 or 25 feet shorter than the fishermen!

Leave your yachting cap at home when you get the



"Drive 'er, Al! Sock it to 'er! Give 'er another, Al!" was the cry of the *Henry Ford's* crew when the water was twelve feet up the deck and the upper deadeyes of the main rigging were buried.

Photo by M. Rosenfeld

chance to sail in a racing fisherman, for the gilt badge and glazed visor cover ideas you will have to jettison. First of all, "sport." What is sport to the yachtsman is not sport to the fisherman. He gets as much kick out of a rattling good breeze and a rattling good boat as any man alive, but he had all the sailing he wanted before the yachtsman got out of knee pants. It's no more treat to him than an automobile ride is to a chauffeur. It is as reasonable to expect Captain Tunney and Skipper Dempsey to sail a match around a squared circle for a flag and the exercise as it is to expect fishing schooners to race for a cup and glory. The fisherman is a working man, and a race means hard work and more hard work. He'll take it on — if it pays.

And why not? He has to earn a living. It costs from $1,000 to $5,000 to condition a schooner for a race and $100 a day to keep her in commission. So forget to sneer about "pot hunting," and remember, as a first and reasonable principle, no pot, no game. Ship chandlers, sailmakers, riggers, outfitters and drydock men do not work for nothing, and every one of them gets his whack, and a big whack, before the racing fisherman gets a chance to earn his hard-won prize money.

The fisherman is no contemner of yachtsmen. Like the rest of the healthy-minded world, he has a genuine respect and admiration for the man who does his job well, whether he wears naval uniform, yachting flannels or a work shirt. But the fisherman has a naive distrust of all race conditions except Board of Trade regulations and the Rules of the Road, which he has had drilled into him from the day he first shipped as a throater. He is particularly bitter when rules are suddenly invoked for his undoing by a well-meaning but flustered committee which may not have the whole facts before them, or which may have, in mistaken leniency, ignored earlier breaches for the sake of good feeling. There is a sound reason for every racing rule, as yachtsmen know; but the fisherman will tell you, perchance with pride, that he isn't a yachtsman; and you had better let it go at that.

It has taken three centuries to bring yacht racing to the perfection it now enjoys as a sport. It is only seven years since fishing schooner racing began as an international institution. It is only necessary to look back to 1920 to see what progress has been made.

Banker cooks pride themselves on their skill, and a turkey dinner for all hands while the race was in progress marked the achievement of the acme of Nova Scotian hospitality during that first race off Halifax in 1920. Nine helmsmen "tried their hand" at *Delawana's* wheel during that race. She lost. But, as the society page used to say, "a delightful time was had by all present."

This, of course, was back in the Homeric period when we had fleets of eight or ten vessels competing. I remember one skipper coming forward at a meeting on the eve of a race with this problem:

"We've just drawed for numbers, and I got No. 8. I ain't kicking, but it don't look to me like I had much of a chanst if seven vessels is going to start ahead of me."

It was explained that his racing number was only to distinguish his vessel from the others, and that he was to get her across the starting line as soon as the gun fired. He went away satisfied, and, if I remember rightly, finished well up in front.

In those unsophisticated days it was greater honor to "give the cut" to your opponent than to finish first — or so some skippers thought. The very first race the famous *Bluenose* won — Novia Scotia fleet championship it was. The big knockabout *Alcala* had us beaten by a quarter of a mile as we stood for Sambro Lightship on the port tack. She was just a little under our lee bow, and away out in front, and we were both laying the mark easily; in fact, we had eased up on the mainsheet purchase, and were beginning to ease a turn or two on the mainsheet bitts. Suddenly *Alcala* hove in stays, filled on the starboard tack, stood across our bows and away out to windward, and then came round again. By the time she got going she was back on our starboard quarter, and the race was ours.

Flattening down the staysail sheet in the *Henry Ford* meant wet socks for someone, but it had to be done. A snapshot on board by the writer.

"I know we threw away half a mile of water doing that," said Roly Knickle, the *Alcala*'s skipper, afterwards, "but I just couldn't pass up the chance of giving *Bluenose* the cut while I had it!"

"You done right, at that," said Long Albert Himmelman, ironically. "You'll never have the chance again."

Long Albert's words were true. He was racing the *Independence* that year. He was lost later, with all hands, in the *Keno;* a splendid fisherman and one of the best racing skippers on the Banks.

These examples are cited, not to poke fun at the racing tactics of schooner skippers, but to show where the education along racing lines had to begin. Much has been accomplished in seven years. I did not see last October's races at Gloucester, but they tell me the starts would do credit to any yachtsman, and I know at Halifax at the same time, where *Bluenose* and *Haligonian* were racing for the championship of the Maritime Provinces (and $4,000), the starts in the four races were magnificent, almost beam and beam and on the crack of the gun.

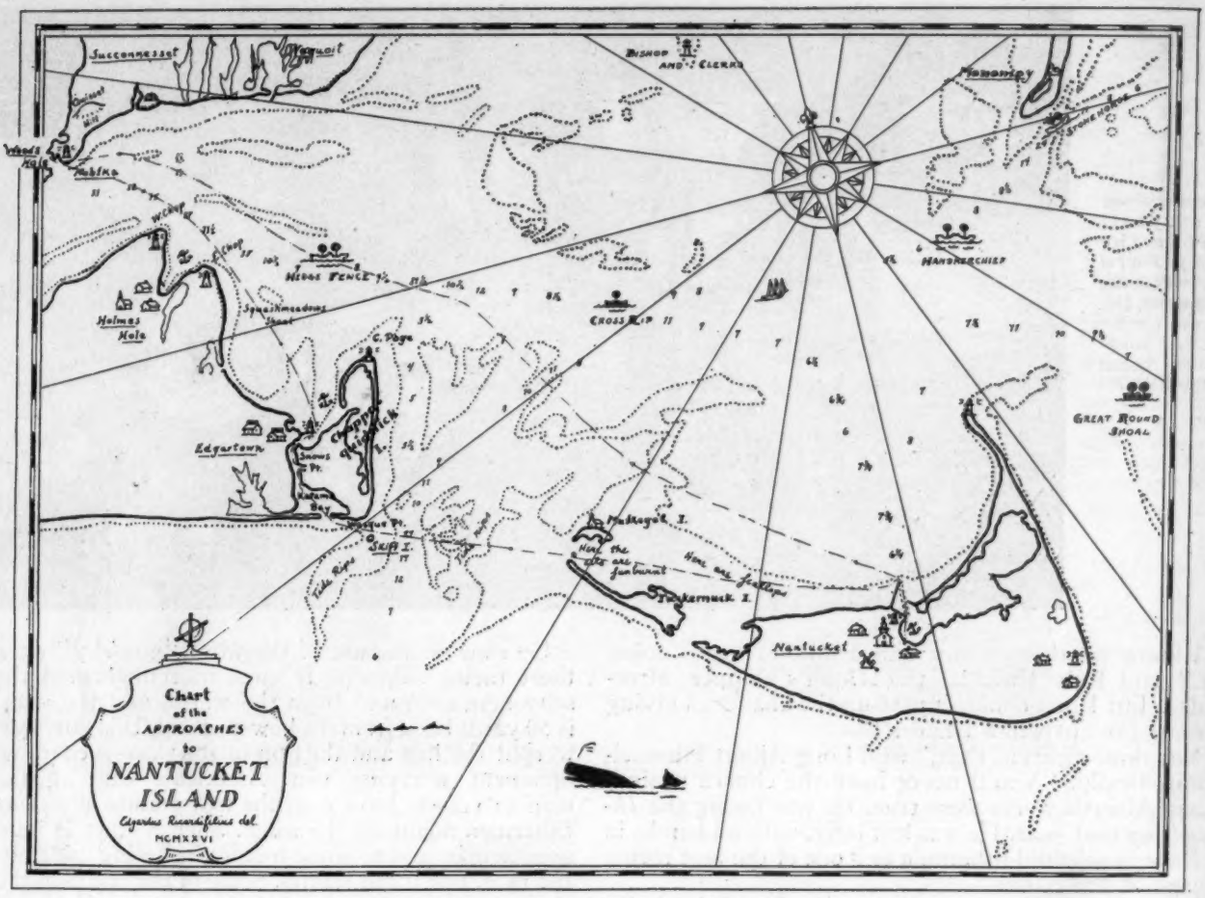
Go slow on the use of the word "gun-shy" on any of these racing skippers. It must be remembered that the schooners are raced from the wheel, and the man there is 50 yards back from the bowsprit end. It is no easy matter to split the line and the gun in the same second, with an opponent worrying you. America's Cup starts, with smaller vessels, have used the two-minute allowance, and fishermen might do the same. Such a start is much less spectacular, and to some minds (including mine) it spoils the race. But it has merits. Some of the starts in the early days were pretty crude affairs; but the yachtsman is putting a small, easily controlled craft across the starting line ten, twenty, forty times a season. The racing fisherman hits the line at intervals maybe one, two, or three years apart. He can't get much race-start practise if he does much fishing.

Well, are these fishermen really fast?

Bluenose created a record for a 40-mile course on October 16, 1926, by tearing around it in 4 hours and 16

(*Continued on page 90*)

At the cry of "Ready, about!" all hands jumped to their stations. The gang aboard *Bluenose* in one of the international races in which she sailed.



The course of the *Vagrant* to Nantucket and return is shown on the chart.

Southeast for Nantucket

A Windy Cruise in an Open Boat

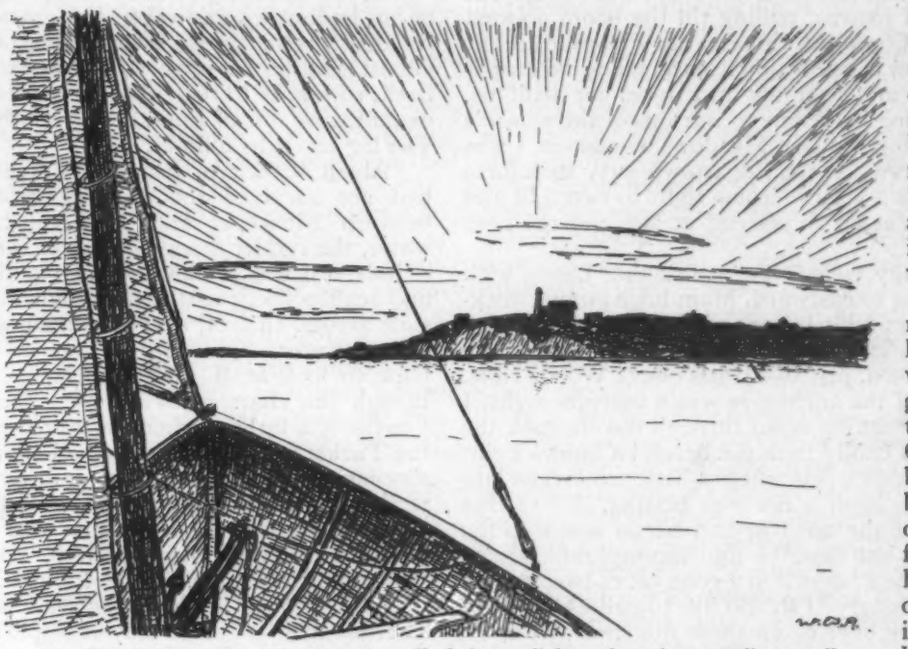
By W. Osler Abbott

WE read a good deal about Bermuda races and trans-Atlantic passages these days; a good deal, too, about the New York "Forties" and the rest of the big fellows, be they cruisers or racers, but just the same there are ten little ones for every big one, and so this yarn shall rise *de profundis* — from the "submerged tenth" of the yachting world, though in all confidence my old hooker has more than once been submerged nine-tenths with naught but the grace of St. Nicholas keeping her afloat at all. And having said this much, I say more, to the effect that a chap can have as good a cruise in a seventeen-footer as in a Diesel yacht if he can dispense with brass bed posts for a night or two and still get his beauty sleep, or if the proximity of salt water does not give him a cold in the chest. I know that already the disciples of Æsop who happen to own hundred-footers are making casual references to what the Oxford Dictionary calls a "red furred, sharp snouted, bushy tailed quadruped" and certain bluish green fruit that grows on a vine, yet if I remember aright Old Æsop was no plutocrat himself, and with the love of good salt water and open boats, which every ancient Greek carried in his body — well, I'm inclined to think that Æsop would have preferred to cruise with me.

But to be specific, the craft to which I refer, though of a type once very well known, is nowadays passing out of fashion and a little detail may call to mind again the lines of an old-fashioned Swampscott Dory, built on the North Shore eighteen years ago and still sound as a bell. Seventeen feet over all, narrow enough for a man to row her comfortably with a pair of seven-foot oars, lapstrake, flat bottomed, able to sail overland on a heavy dew, yet a great one for staying afloat where most open boats would be playing pussy-in-the-corner between every breaking sea and Davy Jones' locker. She sets a leg-o-mutton mainsail and a wisp of jib when working out to windward, or a big ballooner or spinnaker half the size of the mainsail when reaching to leeward. When commissioned for sea the additional gear is stowed in the "fore hold" between the forward 'thwart through which the mast is stepped and the midships 'thwart; this leaves an after "cockpit" big enough for two. It is remarkable how much room is left after storing a water keg, sea bag, tent, keg of food, stack of pots, an inner tube full of charts and the regular equipment of the boat. She carries no ballast and the things that must be kept dry must be slung six inches above the floor boards. But I shall say no more as to statistics and proceed with the yarn.

It was in this rig that the good ship *Vagrant* had sailed out into Nantucket Sound and off to the westward amongst the Elizabeth Islands more than once — cruises in which she had nosed into caves and holes and out-of-

the-way places where nothing drawing more than a finger's depth of water would care to go. She had slipped back and forth between Buzzard's Bay and Vineyard Sound, landing her crew on some little frequented sand beach by night and pushing on by day. Eventually I came to realize her capabilities. More distant ports began to beckon, and so it was that I reached the point when Nantucket began to stand out on every chart as insistently as a boil upon one's anatomy that refuses to be forgotten under all circumstances. Nevertheless, Nantucket was a long way off and the *Vagrant* pretty small. In the end I temporized, and on a fine July day crossed the Sound to Edgartown on the east end of the Vineyard, there to reconnoiter. Following the example of Drake on the Isthmus of Darien, I sought a tall tree, failing which a convenient windmill tower on a rise of ground south of the town was pressed into service. Hastily mounting lest they turn the dog on me, I gained the platform and with a good glass swept the eastern horizon. There lay the yellow sands of Wasque Point, merging into the blue of the Muskeget Channel. But beyond that the unbroken rim of the horizon faded into the soft haze of a summer afternoon. Not a speck that might suggest Muskeget Island,—only the long white lines of the tide rips where the ebb boiled across the maze of shoals into the teeth of the sou'west breeze.



"As Nobska loomed up ahead every puff of air was lighter than the preceding one."

There was food for thought in that sight of the old Muskeget Channel, for the swell of the Atlantic rolls in across those shoals and a three-knot tide sweeps the clean-washed sands back and forth incessantly. Though the *Vagrant's* somewhat sturdier cousins weather the Grand Banks in winter it did not alter the fact that *Vagrant* would have no mother ship hovering near, nor did it shorten the three sea-leagues between Chapaquid dock and Muskeget.

A fortnight later *Vagrant* lay alongside the Marine Biological Laboratory wharf in Woods Hole, commissioning for the Great Adventure. I was particularly careful in shipping my crew, and for that reason Woods Hole was chosen for fitting out, since a certain long, lanky sea dog, four inches over the fathom mark, happened to live there. He was lately returned from a round trip to Hamburg as oiler on a Red Star Liner and had a few days free before college opened. I needed an engineer in case the white ash breeze should have to be broken out or the pumps set in order — matters which I consider too mechanical to come under the province of deck officer. Add to these qualifications a genial personality and a cheerful touch of color by way of hair shot with gules, and no better choice could be made. And so it proved, for when the day of departure arrived it brought weather calling for a crew of old time qualities.

Dawn broke that day with a whirl of gray clouds overhead and with the beaches of the shore of Buzzard's Bay white with foam. The wind had veered to the northwest in the night and now a premonition of autumn had descended on the Cape in the form of a September northerly in late August. By 9 o'clock, however, the sky had lightened up a little and in spite of the sight of fishing boats and lobstermen preparing to spend the day in port the crew of *Vagrant* had made fast everything movable, tied two reefs in the mainsail, making it look like a folded pocket handkerchief, and reefed the jib entirely out of the realm of objects visible to the naked eye. The first entry in the log (kept dry in the food keg) for August 21, 1921, reads:

"9.30 A.M. Shipped Thomas R. Montgomery as chief engineer and took aboard food. Cleared for Nantucket under double reefed main and jib. Wind half a gale from the north'ard. Sky overcast and tide just making to the eastward. W. O. A."

That sail I shall never forget. Everyone thought we were foolish to go, and perhaps they were right. Certainly we had burned our bridges behind us when once under way, for no dory could have thrashed dead to windward in a blow like that. We had decided to head for Edgartown on the first leg of the passage and that lay six leagues to the southeast, almost dead to leeward as the wind blew, while the flood tide was setting to the eastward also. In short, it was a case of no afterthoughts when once under way.

As the *Vagrant* cast off she scarcely more than drifted from the wharf, for Woods Hole Harbor is sheltered from the north and only little scurrying catspaws darting across the water suggested what we would find outside. As Juniper Point bore abeam the wind was still high overhead, roaring in the tree tops as it bowled the great cloud masses before it. Then, as we drew away from the land, it began to dip lower and *Vagrant's* tiny patch of sail would snatch cupfuls of the passing gusts, while white water appeared now along her counter and her lee rail drew ever closer to the water's edge. Not till Nobska dropped astern, however, did we get the full strength of the wind, and then it descended upon us and took possession. I remember flying past a little lobsterman who came chugging into port and as he said afterward, we passed him "like a bat out of Hell."

The rest of that morning is a recollection of many happenings which have lost all chronologic order and merge in my memory as a turmoil of wind and water and sound. I remember perching high on the weather rail with my weight thrown far to windward against the pull of the main sheet. I remember Tom's long arm moving ceaselessly as he bailed, and only the steady use of the bucket

kept down the water that poured in over the lee rail with every sea. I remember the floor board awash, and the constant spatter of spray, and the big white topped seas surging up between me and the horizon, time after time. Yet, above all, I remember the thrilling beauty of it all, the miles of surging blue and white with the great purple cloud shadows chasing one another across the Sound. It was a morning of brilliant clear air and the white cottages on West Chop seemed fairly to sparkle in the sunlight. As I remember it now, we had scarcely noticed West Chop ahead when it had gone and Vineyard Haven was opening out, only to close again as the yellow of Oak Bluff swung round abeam and finally astern of us.

From the start we had been drenched to the skin and going through the rip off the west end of Hedge Fence, in particular, she was almost under more than once. Yet the little patch of canvas, pulling till the boom pointed skyward, seemed literally to lift her out of water and at times I expected her to rise bodily from a boiling old grandfather of a wave and soar off into upper air with us. Boreas that morning had come to warn us of the season's close, and long before Squash Meadows was astern I was frozen to the marrow. As the Edgartown jetty took form ahead of us, it was a very welcome sight to two cold and weary mariners. Yet all things end at last and the next entry reads:

"11.00 A.M. Sky clear, wind continuing heavy with tide running strong to eastward. Main bilge pumps working to capacity on midship bilges and after well. T. R. M."

Fifteen minutes later we were around the end of the jetty into Edgartown, just two hours out of Woods Hole. The quiet water of the anchorage was a welcome sight, I can tell you, and running down through the channel, the good ship *Vagrant* finally took the beach on Snows Point on the Chappaquiddick side where a little creek runs into the main channel. Soon a fire was blazing, dry clothes were fished out of the sea bag and bacon was sizzling. Ha! Ha! How can one describe that incomparable sensation of clapping one's fangs into a good bit of bacon when you are cold and hungry? I should like to pause a moment in this yarn to live over again those first few mouthfuls of hot food after two wet and chilly hours of such sailing.

But to continue: the afternoon was passed in a ramble through the scrub pine, oak, and bayberry bushes of Chappaquiddock to the east side of the island for a look at the Muskeget Channel, now boiling merrily under the lash of the north wind. When we turned in that night the wind was still whistling through the cedars near the tent and finding the thin spots in our blankets with unerring aim.

Dawn broke upon two figures frantically dashing up and down the beach to start a brisker circulation. By dint of combined efforts breakfast was over and the good ship under way again while the sun was still balancing on the eastern upland of the island. Our course was south into Katama Bay before a wind now due north and blowing a fresh breeze. Then, as the shallow waters of the bay opened out, the passage in the south shore appeared. Not long after, the *Vagrant* slipped out between the flanking sand spits, rose slowly to a long lazy swell that rolled in over the bar, and so was afloat at last upon "the bosom of the broad Atlantic." After the tumult of the preceding day everything seemed extraordinarily peaceful. Under the lee of the land the water was scarcely ruffled and the *Vagrant*, under all sail, slipped merrily along. Presently Wasque Point drew abeam, flicked out tail feather with a spatter of foam as a swell broke between Wasque and Skiff Island, and a moment later we were in deep water again, heading on a compass course to the eastward toward an unbroken horizon.

There is something about the sensation of heading out to sea in a small boat that invariably makes me feel philosophical. I could drift off here into generalities on sailing, but I shall spare my reader (since I am a reader myself, on occasion, and have a little fellow feeling in the matter). Moreover, as we bowled along with the fresh breeze abeam and not a cloud in the sky, the deep west side of the channel, which is the real ship channel, slowly turned from blue to blue green and then to yellow green. Looking down through the clear water, we glimpsed the spotless white sand beneath us with the tide boiling over the ridges and, now and again, a patch of brown sea weed or a stray conch. Then we would slip into deeper water once more and the bottom would fade away. As we watched the long curving lines of the tide rips winding toward the horizon, white against the blue green of the water, we suddenly noticed that a speck upon the sea ahead had grown and taken form as the land astern had receded. Presently, we recognized it as Muskeget Coast Guard Station and, then, as we watched, Muskeget itself, so low as to be scarcely visible a league and a half distant, rose out of the sea, and south of it Tuckernuck. The log has it as follows:

"About 9.00 A.M. (the ship's Ingersoll chronometer had not survived the morning before). Ran through between Muskeget and Tuckernuck in very shallow water, the rudder dragging part of the time. W. O. A."

Indeed it was shallow, — gray mud with low eel grass and scallop shells and just enough water for *Vagrant* to slide across. In fact, every flounder we saw had its eyes out of water — except one that was swimming on its back to look at the bottom. Then, into deeper water, though the chart reads between one-fourth and three-fourths of a fathom where we were sailing, and so across the Tuckernuck Banks with the long arm of Tuckernuck slipping by to leeward. The wind, however, was veering to the east and as Nantucket Island took the place of its smaller vanguard the main sheet was coming in a foot at a time till an hour or so later the boom lay almost fore and aft. It was a welcome sound, indeed, when Tom raised Nantucket jetty at last, and tacking out along its interminable length we stayed ship and about 1.00 P.M. rounded Brant Point experiencing sensations akin to those of Captain Christopher C. upon making the Island of San Salvador.

In the succeeding episode there is a deep moral lesson about being ruled by one's stomach, for we were then six hours from breakfast and no more need be said. We beached her upon a salt marsh just south of the town, thinking that we would leave her there till night, sail across the harbor to Coitu Point and camp on the fine sand beach there. Hastily leaving her, we hurried into town to find a restaurant. Our hunger appeased, we prowled the streets of the glorious old port, admiring the houses and letting imagination supply the missing facts — and Heaven knows there is enough in that town to keep the most unimaginative mind busy. Down by the wharves the hot sun still brought out a smell which plainly said that not all Nantucketers were like the one in the song who came back after a three years' cruise:

"And as he came around Brant point
He flew his penant high,
And as he tied up to the wharf
Right merrily did he cry:
'I've come back cleen as I went out,
I haven't raised a whail,
I haven't got a bar'l of 'il
But I've had a danged fine sail'!"

But too much has already been written of this island for me to try and add my bit. Toward sundown we

(*Continued on page 86*)

The Aerodynamics of Sails

Part III — The Reciprocal Influence of the Sails

By Dr. Manfred Curry

THE relation of the sails to one another has seldom been treated at all and is practically unexplained. It would be both interesting and instructive if one could give exact information about the influence of the mainsail on the jib, or *vice versa;* and if one could state definitely the correct size and form of the jib and ascertain just how far it should reach behind the fore leech of the mainsail.

I must admit that I have only lately succeeded in bringing these questions nearer to a solution. The first and essential obstacle to a clear understanding presented itself to me in this manner: If, as we have found, the chief driving power of the sail is in the suction, then why does not the wind off the jib nullify this suction in the mainsail? If, on the one hand, the great power of the suction is established and, on the other hand, it has been confirmed by experience that the jib is decidedly advantageous, then where does the fallacy lie?

We know that a boat with a jib is superior to a cat-rigged boat with the same sail area. This has been proved by re-rigging the self-same boat, as well as by comparison with other boats; in fact, a sloop-rigged boat with a total sail area of 25 square meters (about 30 square yards) is known not to be inferior to a cat-rigged boat with a sail area of 30 square meters (about 36 square yards). Also, we may have often noticed with surprise how much slower a boat moves the moment the jib ceases to draw, this being especially marked on the wind and with the wind abeam.

For the solution of these problems a discovery which has been made in the technique of flying is of great significance. This is the invention of the Handley-Page and the Lachmann aeroplanes. Both inventors succeeded in attaining greater carrying power by affixing a small narrow auxiliary plane in front of the main carrying surface. Especially for the somewhat larger angles of opposition to the wind, 10° to 15°, the greater efficiency of these planes appears in a striking manner.

May not we yachtsmen maintain that this is nothing new to us; that we have, in fact, benefited from its advantages instinctively? What the technique of flying has only lately discovered for the plane in horizontal position, the principle of the jib, has been the common property of all mariners for years. The Handley-Page gains greater carrying power by using the little fore "sail" to throw air onto the main plane, whereas Lachmann simply makes a small narrow slit in the main carrying surface a short distance from and parallel to its fore edge, thus dividing it into a smaller fore and a larger rear wing (*cf.* diagrams I). The slit passes from below diagonally through the surface toward the rear, growing narrower and narrower, so that here, as in the Handley-Page, the air is conducted as through a funnel onto the upper surface of the main wing. How ingenious and valuable this device of the air conducting fore wing really is may not appear at first sight; it was, at least, the case with me, when my attention was first called to the Lachmann slit. Not until I had succeeded in identifying nature as the inventor of this recently adopted innovation in the technique of flying could I reconcile my theories of sailing with it.

As in thousands of other cases, man does not invent; he only observes casually what nature presents. The *bird* possesses on the fore edge of its main wing a tiny narrow wing, which acts as a conducting surface in throwing the air onto the main wing. Although with our small birds this fore wing is, if at all, only slightly developed, many of the large birds of prey, such as the eagle, possess it in a marked degree. This conducting wing on the fore edge of the main wing projects somewhat beyond the latter, as shown in the photograph. Hitherto no explanation has been offered for the function played by this small conducting wing. In the insect world, with the June bug for

[This is the third of a series of articles on the Aerodynamics of Sails and the Art of Yacht Racing, from the book of that title, shortly to be published here by Dr. Curry. — Ed.]

Eagle's wing, showing fore-wing similar to jib in sloop rig.

Cross sections of (right) Handley-Page and (left) Lachmann aeroplanes, showing narrow auxiliary plane in front. Diagram I.

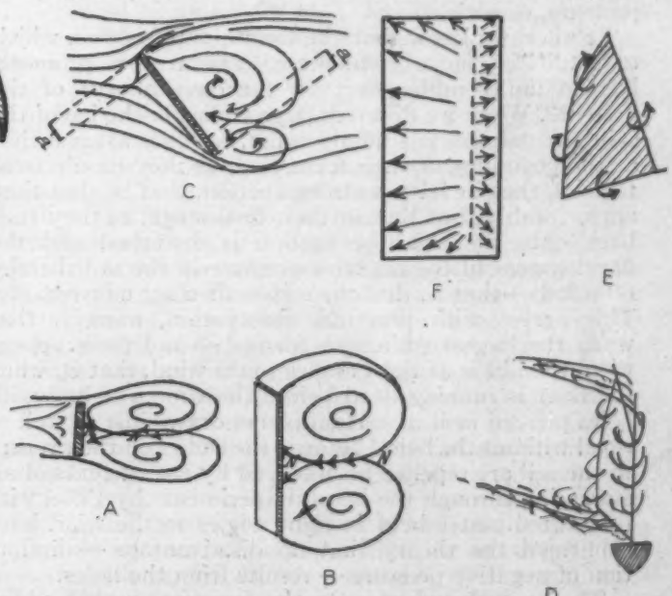


Diagram II. (A) Return or back current, showing eddies on long side at N. (B) Return current, showing eddies on narrow side. (C) Angle of opposition 45°. (D) Angle of opposition 15°. (E) Angle of opposition 90°.

Diagram III. (A) Air streamlines on cat rig.

Diagram III. (B) Showing change of air streamlines through use of jib.

example, the stationary fore or, so-called, protecting wing, appears to possess an air guiding function. With most flying insects the fore wings are also smaller and, curiously enough, always overlap the hinder wings somewhat.

But all these facts apparently contradict the suction theory, and up to the present the technique of flying has failed to arrive at any definite conclusion with regard to these peculiar phenomena. In order to facilitate the understanding of the problem, let us briefly review the manner of action of the "suck."

We know that the suction developed on the lee side of the sail is to be attributed to the partial vacuum that actually exists there. The sail is pulled or sucked into this space, while the various currents of air in the neighborhood are naturally drawn into it from all sides and tend to fill it and thus to reduce the negative pressure. We also know that a current of air arises only in consequence of difference in density of the atmosphere. The wind itself is, in fact, caused by the tendency of the atmosphere to adjust all inequalities in density, which are due principally to difference of temperature.

The suck on the sail acts, as may be confirmed, close to its surface, and we should not allow ourselves to be misled by the diagrams already presented — the curves, the abscissae of which represent the pressure and suction on the sail. These curves give the values of pressure in question on the sail itself, not the extent of action of that pressure, or suck.

Further, we know that the formation of eddies, which unfortunately most of our present sails tend to promote, has an unfavorable effect on the development of the pressure. When we discover large eddies in the lee of the sail, not only on but off the wind, we may assume that at the beginning of their formation, as they recede from the sail, they develop a strong suction, that is, that they act favorably; but that in their final stage, as they turn back onto the sail, the suction is disturbed and the development of the negative pressure in the sail thereby retarded — that is, that the eddies then act unfavorably. This agrees with practical observation, namely, that when the largest eddies are formed — and these appear when the sail is at right angles to the wind, that is, when the boat is running dead before the wind — a sail with holes pierced in it at certain places draws just as well as a sail without the holes, because the eddies on their return to the sail are repelled or dissolved by the currents of air streaming through the holes. Experiments by Eiffel with perforated plates held at right angles to the wind have confirmed the theory that no disadvantage — diminution of negative pressure — results from the holes.

The next thought is: On the assumption that eddies have already formed, could one reduce their unfavorable influence on the suction by intercepting them in their final stage — on their return to the sail? We can easily imagine that, could we prevent the air currents from streaming *into the partial vacuum* produced by the eddies as they recede from the sail, the sail would develop a correspondingly greater suction or pull, due to its increased effort to fill out that space.

That the suction is increased, when an eddy is intercepted on its return flow, is confirmed by the experiments of Prof. Ahlborn with submerged plates. . . . By means of a camera, which was moved along with the plate in the water, Prof. Ahlborn photographed the currents formed by a rectangular plate of the relation, length to breadth, of 3:1. A study of the photographs showed the following:

I. On the longer sides, which correspond to the fore and after leech of the sail, the large eddies formed at the edges describe two large ellipse-like curves and finally unite to form the so-called "return" or "back current" (see A, diagram II). With the plate placed at right angles to the current, this hits it on the back, exactly in the middle. The less the plate is inclined to the current, the more this center of the back current shifts toward the rear and the more the eddy of the fore edge increases in size and that on the rear edge decreases. This return current hits the back of the plate at exactly the same distance from its rear edge as the dividing line of the current on the front of the plate is distant from its fore edge (see sketch C, which presents the same view of the plate, as seen from above, as sketch A; it is drawn on a larger scale only to facilitate examination).

II. Eddies are also formed on the two shorter sides of the plate, which correspond to the gaff and boom of the sail, the upper one turning downward and the lower upward. These eddies are considerably weaker than those formed on the longer sides, but they are larger or, rather, they extend to a greater distance from the plate. Their back current unites with that of the eddies formed on the longer edges, and the two thus combined form the common back current.

It is this "return current" which causes papers and other light objects to fly along behind the last car of a moving train or makes the hair of those sitting behind the windshield of an automobile blow forward into their faces. Similarly, the pacemaker on a motorcycle is enabled to "suck" along in his wake the cyclist directly behind him. The former, in fact, makes use of a broad plate made fast to the rear of his motorcycle at right angles to the direction of motion, which has the effect of increasing the suction to such a degree that the cyclist following him is able to attain a speed of 120 kilometers (75 miles) or more an hour.

III. With the plate inclined to the current, the relation of these four principal eddies to one another is not always the same. The less the plate is inclined to the current, that is, the smaller the angle (of opposition) at which the current strikes it, the more pronounced are

the eddies formed on its side edges; that is to say, these stronger eddies (sketch A) which are flowing toward the region of negative pressure on the lee side of the plate, suppress more and more and thus, finally, destroy the weaker eddies coming from its upper and lower edges (sketch B), so that:

IV. At an angle of opposition of 50°, the latter are so completely torn asunder that they cannot return to the plate; in fact, before they have begun to return, they are intercepted by the outward currents of the larger eddies and, thus being detached from the plate, flow off from its edges in the form of long drawn out spirals, the so-called "pigtail eddies" (*cf.* sketch D). The formation of these spirals becomes so marked at angles of 20° to 25° that they actually drag portions of the main side eddies along with them on their course.

Now, if our conclusion concerning the harmfulness of the return current or "back drive" of the eddy is correct, then, the moment the upper and under eddies cease to strike back on the plate, and, in the form of spirals, draw off on a straight course, an increase in the suction and hence in the total pressure or effect must occur. This is actually the case.

The total pressure on a rectangular plate attains its maximum at an angle of opposition of about 20° to 30°, depending on its relation of length to breadth, and not, as one might expect, when the current strikes it at right angles — at an angle of opposition of 90°.

Accordingly, upon measuring the pressure at various points on the back of the plate, when it is inclined at small angles of opposition, we should expect to find the suction along its shorter edges, from which the "pigtail" eddies are detached, appreciably increased. This also proves to be true.

Eiffel found the pressure always markedly increased on the short sides; the suction curves of the diagrams for the lee side of the sail confirm this. On a further inspection of these curves, especially of those for the gaff sail, we recognize that there is a certain point of zero pressure which is confined to those regions, where the return or back currents of the eddies hit the sail.

It thus follows that every return current, that is, the back drive of every eddy, is detrimental, and that the interception of every such current is equivalent to an increase in the pressure (suction).

We can now return to the reciprocal influence of the sails. Let us examine the approximate course of the current as it is represented in the two drawings, A and B, diagram III. These lines of flow may be determined on the sail itself with down or, on surfaces similar to sails, which one moves through water, by the method already employed in the chapter "Hydrodynamic Experiments."

Drawing A represents the cross section of a catboat's sail full on the wind. Due to the action of the eddies, the drawing shows two systems of forces, those of suction

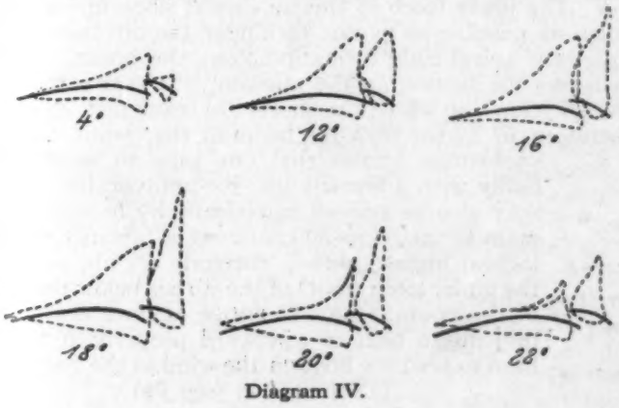


Diagram IV.

The jib can overlap as shown, with good effect.

which act favorably and those of the reactionary or retarding forces.

If we now imagine the same mainsail in the same relative position to the wind, but with jib set and drawing, the picture undergoes a decided change (see drawing B). With reference to this drawing let us recall the experiments with the down: The eddies have practically vanished; the wind flows in the lee of the mainsail straight toward the rear; this is to be ascribed to the wind off the jib, which is directed aft over the mainsail. If we hold the down at a distance of one or two meters from the sail we can detect the remnants of eddies that have been intercepted by this back wind. In other words, the back flow of the eddies is blocked from reaching the mainsail by the current of air off the jib flowing directly across its path. Thus we perceive that, when the jib is correctly trimmed, the beginning of the eddy, flowing off in the direction of the suck, is not materially influenced by the wind off the jib, whereas its return current is intercepted or, at least, thrust aside and carried off toward the after leech of the mainsail. In the more scientific terms of the technique of flight, we may say that by the device of the funnel, which causes a contraction of the air between jib and mainsail, the velocity of the current in the lee of the mainsail is accelerated. As the rider of a motorcycle, running at high speed, is unable to describe a sharp curve, so this current of air, being accelerated, will not be deviated from its path by the partial vacuum immediately in the lee of the sail and will not be drawn into it. Consequently, the sail will be sucked into this space with increased force. Or, in physical terms, the greater the velocity of this current of air, the less the atmospheric pressure and, hence, the greater the negative pressure.

But we can learn still more from the drawings. The wind, which strikes the fore quarter of the mainsail, especially on a somewhat free course, and tends to pass forward around the mast to the lee, is caught or thrown onto the jib. This is one of the reasons why the jib develops a disproportionately large driving force to its area.

Every yachtsman knows how important the clever handling of the jib is; also that, especially with the wind abeam, a boat sails to a great extent with the jib. But the wind passing from the mainsail around the mast produces an increased drive not only where it strikes the jib, which is only in its after third, but also in its fore portion by causing the current of air to strike the sail more from the quarter. This is confirmed by the empirical fact that the jib can be carried at a much larger angle to the wind than the mainsail. And this explains my statement above that the jib develops greater driving force in proportion to its area than normal. Thus we see that the two sails are influenced to a great extent by each other, the driving force of the mainsail being increased by the presence of the jib, and that of the jib by the mainsail. It is, moreover, interesting to examine and compare the approximate curves for the pressure in the luff and for the suction in the lee of a jib and mainsail boat at various angles of opposition (See the systems of curves, diagram IV; the dotted lines show the proportionate amounts of pressure and suction).

The almost abnormal suck of the jib at the angle of opposition of 18° is most striking. The obvious explanation for this is that the return current in the lee of the jib is also somewhat influenced; that is, checked on its return by the accelerated speed at which the air is forced through the funnel-like passage between jib and mainsail; in other words, it is not easy for the air, at the high speed at which it is pressed through the funnel-like slit between the two sails, to be diverted from its path toward the region of the partial vacuum in the lee of the jib. Furthermore, the customary proportion of length to breadth in the jib is almost always favorable.

Now we understand the direct advantage of the jib and also its indirect advantage in increasing the suck of the mainsail. Furthermore, we know why a catboat is apt to have a weather helm and why a sloop rigged boat of the same relation of the center of effort — the center of effort of the combined sail area, to the center of the lateral plane — does not. It is only the greater driving force developed by the jib which has obviated the weather helm.

We are enabled from all this to determine with a certain degree of accuracy the most advantageous form of jib. However, this has been pretty well established, though more or less unconsciously, by practice.

For turning to windward the jib should be cut according to the following principles:

I. The jib must operate so that its back wind does not flow into the region of the partial vacuum in the lee of the mainsail, but, on the contrary, prevent any influx of air, especially from the return currents of the eddies, into that region by its own flow, which should be directed somewhat away from the mainsail.

II. It must not be cut too full — with a large belly — because it would not fulfill the conditions demanded by I. It is quite impossible to beat to windward properly with a jib that is cut too full.

III. The jib should reach well aft of the fore leech of the mainsail, because thereby the lines of flow will act more effectively. The extent of the overlap depends, first, on the beam of the boat and, second, on the breadth

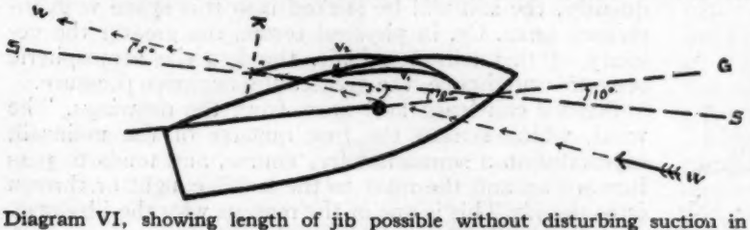


Diagram VI, showing length of jib possible without disturbing suction in mainsail, if it is held in the right position.

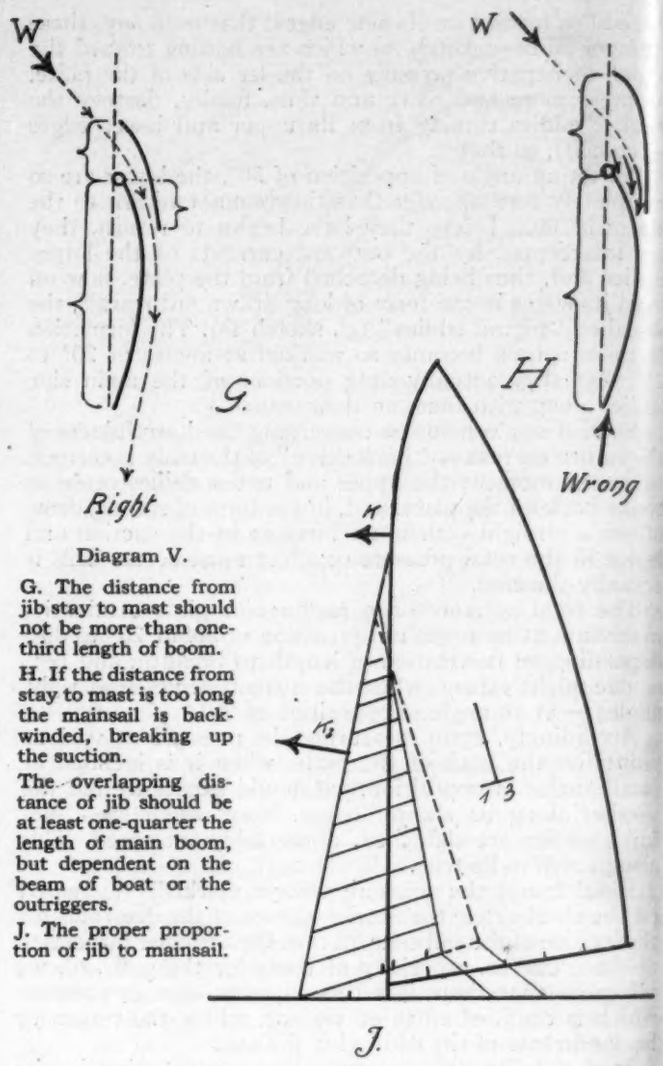


Diagram V.

G. The distance from jib stay to mast should not be more than one-third length of boom.

H. If the distance from stay to mast is too long the mainsail is backwinded, breaking up the suction.

The overlapping distance of jib should be at least one-quarter the length of main boom, but dependent on the beam of boat or the outriggers.

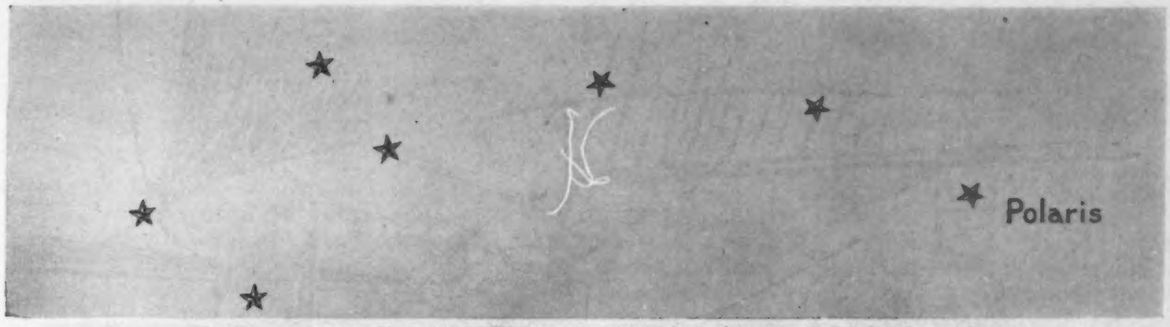
J. The proper proportion of jib to mainsail.

of the mainsail, and should amount to at least a quarter of the length of the boom. Battens in the after leech of the jib are essential, because without them the leech is apt to roll inward.

IV. The jib should reach up on the mast as high as possible, so that its favorable influence may extend to the entire mainsail. One might recommend having the boat's sail measured for two jibs: a high, narrow one set farther aft on deck for light airs and a lower, broader one set well forward for strong winds, this latter for reasons of stability and to reduce that sagging of the fore leech, which is so difficult to correct, when the wind increases.

V. The lower leech of the jib should slope upward as much as possible so as not to hinder the advantageous "pig-tail" spiral eddy formation along the boom, which increases the suction on the mainsail; the rear corner of the jib (clew), to which the sheets are made fast, should, therefore, lie higher than the boom at that point. Every yachtsman knows that one sails to windward badly with a low-cut jib. Its unfavorable effect may also be proved empirically by hoisting the main boom 20 to 30 centimeters (about 8 to 12 inches) higher, with a correctly set jib, so that the under leech (foot) of the jib lies below the line of the boom. One will notice at once that it is difficult to beat to windward properly, it being hard to hold the boat on the wind as she has such

(*Continued on page 96*)



The Constellation of the Little Dipper in which Polaris (the North Star) is located.

Spotting the North Star

A Simple Wrinkle for Getting Polaris Into the Field of the Sextant Telescope at Twilight

By COMMANDER G. T. RUDE, U.S.C.G.

FROM early times the sea has held a peculiar fascination for the human race, probably due to the belief that beyond the horizon lay wonderful lands, habited by strange people and offering opportunity for wealth and riches. The sea has now been robbed of much of its mystery by the curiosity and the ingenuity of man; yet to many unacquainted with navigation mystery still surrounds the accurate location of a vessel on the ocean by means of beams of light from other worlds.

Some mariners even now hesitate to use stars in their navigation, confining their observations to the sun only. This hesitancy is undoubtedly due to the fact that one star may very easily be mistaken for another by one unfamiliar with the constellations, resulting in chaos in the computation of the observation, whereas the identity of the sun is unmistakable.

Polaris, the North Star, furnishes a convenient and simple means for the determination of latitude at sea by the application of only a small tabular correction to the observed altitude of the star, since this star describes a comparatively small circle in its apparent revolution around the celestial pole. Yet many navigators do not make use of Polaris to any extent because it is a low magnitude star. Were Polaris a star of large magnitude this method would be ideal for use at sea, but being of small magnitude its accurate observation is rendered somewhat difficult, especially for a twilight observation. By the time the star becomes visible to the unaided eye, the horizon has become rather indistinct for an accurate observation.

This tabular correction is the star's angular distance above or below the celestial pole at the instant of observation, thus furnishing the altitude of the pole with sufficient precision, and therefore the value of the latitude, for the determination of a vessel's position at sea. Table I of the Nautical Almanac contains the corrections for each 10-minute interval of local sidereal time for finding the latitude by an observed altitude of Polaris.

While navigator of a troop transport during the World War the following wrinkle, which was used by the writer, proved of value for "spotting" accurately the position of Polaris for the time of observation. By use of this method the reflected image of the star can be "picked up" in the telescope of the sextant before the star becomes visible to the unaided eye, thus permitting an observation to be made before the horizon becomes indistinct in the fading twilight. The method is simple, and with little outlay of time can be used at dawn also for readily getting the reflected star into the field of the telescope without the necessity of "bringing it down" to the horizon. The wrinkle, in part, is simply a reverse application of the Nautical Almanac method, the correction from Table I being applied, *with sign reversed*, to the approximate latitude of the ship for getting the altitude, instead of with its *proper sign* to the observed altitude for finding the latitude, as was intended from the table.

To those familiar with the method, known as dead reckoning, for keeping track of a vessel's position at sea by means of the courses steered and the estimated speed of the vessel, it is a simple operation to estimate with a fair degree of accuracy the position of the vessel for some predetermined time at which it is desired to make an observation on the star, say 15 minutes after sunset. This estimated position will ordinarily be in error not more than 5 to 10 miles even though the dead reckoning may have been brought forward from the noon position, or even a greater distance. To the dead reckoning *latitude* thus obtained the correction from Table I of the Nautical Almanac is applied *with the sign reversed*. The result is the approximate altitude of the star for that place and for that predetermined time of observation.

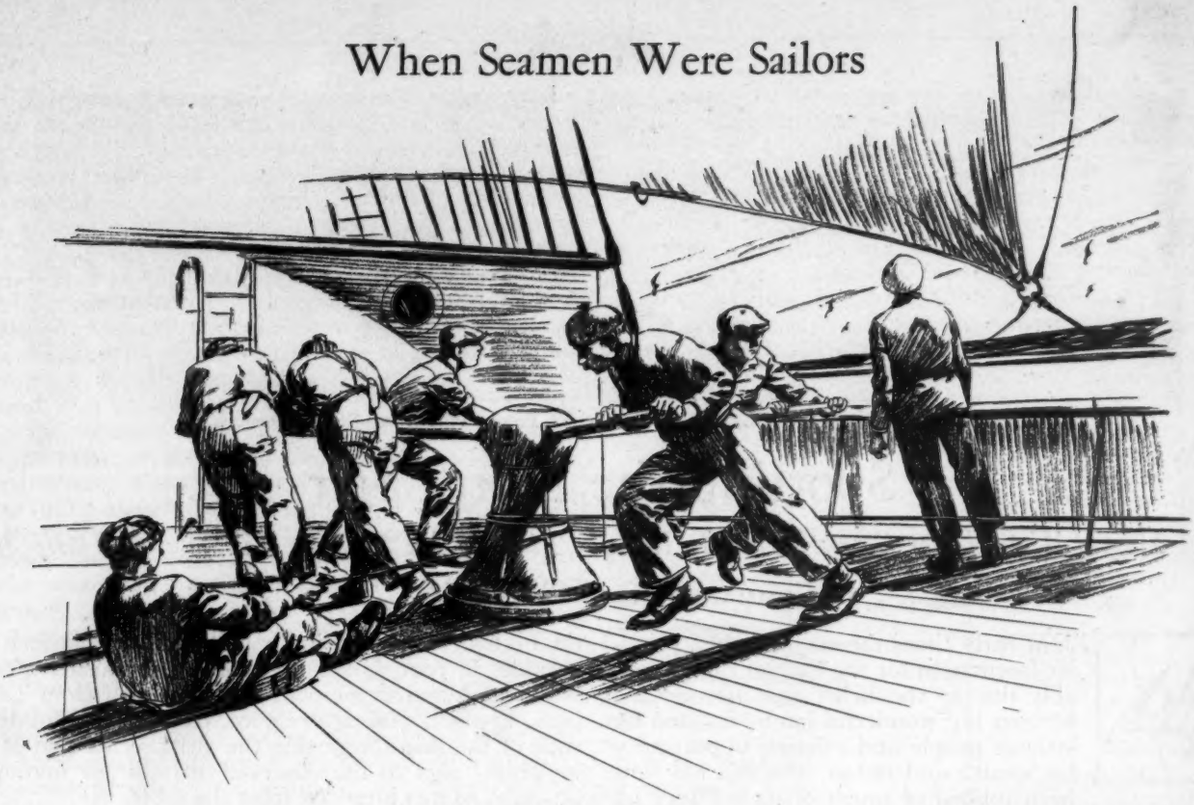
Since the true course of the vessel is known, it is also a simple matter to set the pelorus (dummy compass) so that the sight vanes point true north. With this computed approximate altitude of Polaris set on the sextant, the observer sights the horizon through the telescope in the direction indicated by the pelorus sight vanes. The reflected image of the star will be seen in the field of the telescope, only a few turns of the tangent screw being required to bring the image exactly to the horizon. An example will serve to illustrate the method.

Example. — December 25, 1926, at about $17^h\ 00^m$ ($5^h\ 00^m$ P.M.), local civil time, when the Greenwich Civil Time is December 25th, $21^h\ 56^m\ 00^s$, in latitude 37° 15′ North, longitude 74° West of Greenwich, by dead reckoning, required the altitude of Polaris.

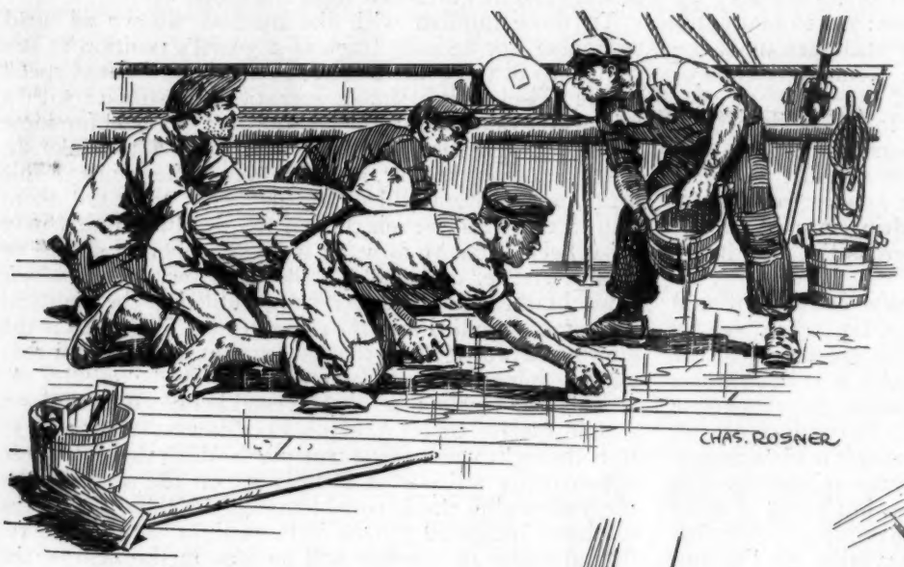
	h.	*m.*	*s.*
Greenwich Civil Time	21	56	00
Greenwich Sidereal Time of 0^h Greenwich Civil Time, Dec. 25th, page 2, Nautical Almanac	6	11	00
Reduction from page 2 for Greenwich Civil Time ($21^h\ 56^m$)	+	3	36
Greenwich Sidereal Time	28	10	36
Longitude, 74° (minus if West, plus if East)	−4	56	00
Local Sidereal Time	23	14	36
Latitude by dead reckoning	37°	15′	
Correction (sign reversed) from Table I, bottom of page 104, Nautical Almanac	+0	53′	
Altitude of Polaris at 5:00 P.M. (L. C. T.)	38°	08′	

(*Continued on page 88*)

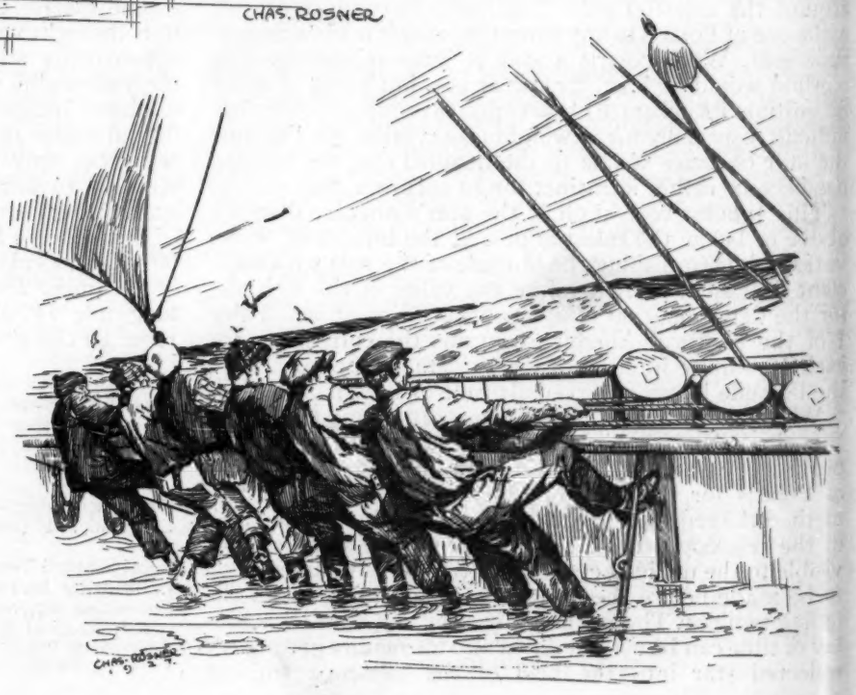
When Seamen Were Sailors



A pull on the main sheet. With the small crews on the later windjammers the wire sheet was led to the capstan on the main deck and "hove in."



Holystoning decks. With a canvas pad under the knees, a "prayer book" in hand and the bo'sun wetting down, cleaning decks was never a popular pastime.



Right: Lee fore braces! The watch tailed out on the fall, bracing the yards up sharp.

From drawings by Charles Rosner.

"Save an Inch"

The Result of a Niggardly Policy in Sending a Ship to Sea Poorly Found

By F. W. SIDDALL

TO outward seeming the *Larrel* was as any other southward bound ship, and, slipping through the Trades, carried out the routine of overhauling gear as would a better found vessel. But the groups of men on deck and aloft worked with that lack of interest always shown on uncongenial tasks. Talk was not of the "last ship," but vividly of the present one, of parcelling renewed to cover bad places, of service dried and denatured, thin and brittle, just tarred and refitted, though it afforded no protection to the wire it was supposed to guard.

Old Jim Hayes was especially bitter. A fine seaman, used to good ships, the brace pendant stretched along the deck was fit only for scrapping as well he knew, and his protests had resulted in hard words from the mate.

"A danger to everyone," was his verdict, one in which the officer could not but concur; the perished appearance of the wire clamored loudly that its day was done. Rust had eaten into the lay where paint had failed to exclude searching rain; here and there snags showed that threads had parted, but no satisfaction could be obtained.

"Slap on a coat of white lead and send it aloft again," was the order, so aloft it had to go.

Each man had his tale of neglect where there should have been care, of paint used to hide defects, and though day by day the ship attained a smarter appearance it was on the surface only, and the resolution to "get out of her quick" was no idle one.

Bad feeling was accentuated almost to the point of mutiny when it became known that the main-topsail halliards, long overdue for replacement, were not to be renewed, but spliced. At first received sceptically, doubt was set at rest by the order to stop off the halliards, and bitter altercation followed as the unrove tackle showed worse even than expected. Knowledge that the mate shared their views on the subject added point and strength to remarks, which increased rather than diminished when the captain came to inspect the job.

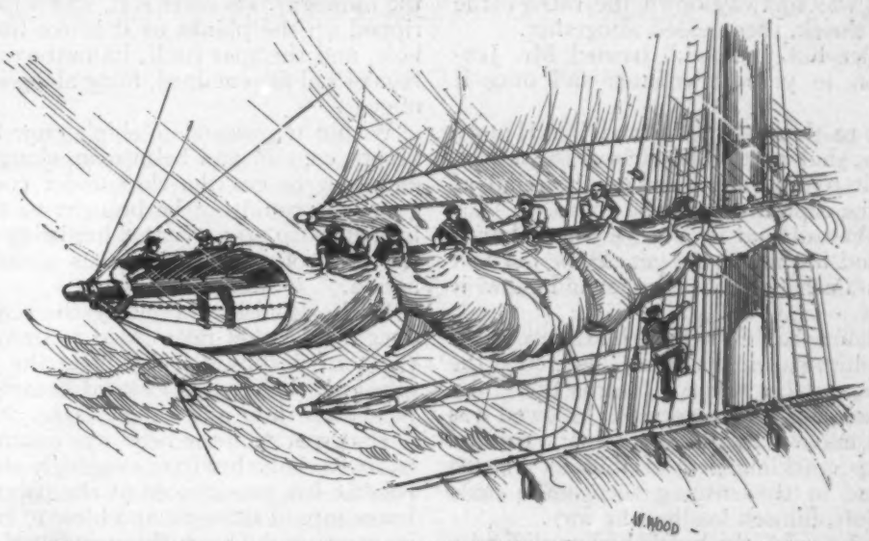
A more experienced chief would have refused to carry out the work, but Mr. Jennings was making his first voyage in that capacity and gave way before the direct orders of his superior.

"Save an inch, I tell you," shouted Captain Evans excitedly. "The owners pay you to look after the ship's interests, and if you splice a new piece in the wake of the blocks it will be as good as ever."

Thus rebuked before the men, Mr. Jennings walked away, leaving the captain to carry on the work.

Jim Hayes and Big Hansen did their best with the splice, but it was impossible to marry new and old successfully. Stretched by long usage, the latter had lost nearly a third of its diameter and the new strands ran hard and bulging in the lay, whilst the tucks showed gnarls and projections which no amount of rolling could reduce. Worse than all, the perished yarns crumbled as they were unlaid, whilst the new tucks had little grip from strands rendered inelastic by constant strain.

So the work proceeded until the last of the South East Trades saw a ship outwardly ready to meet heavy weather, brace pendants shining in newly applied white lead, chafing gear in place, and parcelling redolent of Stockholm tar.



"Strung out along the yard, the men had little difficulty in getting up the slack."

But these were used to hide defects, not remedy them, and, to a keen observer even the paint on the bulwarks told its own story, for its whiteness was that of constant washing, and here and there in the center of a panel the darker iron showed through. A mean ship, run on the principle that for an immediate saving, however small, it was worth risking a greater expenditure in the future.

As was inevitable in such conditions, dissatisfaction ruled everywhere. The forecastle hands, bound together by a common grievance, displayed unanimity of purpose which showed the divided state of the afterguard even more prominently. There the captain walked alone, cut off from the good will of his officers by constant bickerings, neither shielding nor sparing the other, as is the rule of shipboard. No chanty was ever raised without reference to "Save an Inch," and the most scurrilous verses passed unrebuked by the mates.

Rotten in gear and personnel, the *Larrel* was in no shape to face gales, and all hands watched anxiously when, off the Plate, the setting sun showed hard and dilated. With the whole western sky suffused by a vivid coppery glow, which remained long after darkness should have fallen, and tinged the upper edges of heavy cumulus clouds with the glaring hues of white hot iron, it did not require the barometer's fall to herald a pampero.

Lightning flickered on the horizon as the three royals were handed, their canvas hanging limp and motionless in the gear. Topgallant sails followed in quick succession and all hands lost count of time in the rapidity with which events developed.

In a deluge of rain the mainsail was clewed up, the men working in an inky darkness strange to the tropics, feel-

ing their way aloft, moving with a certainty only long familiarity could give.

The foresail followed, but when the fore-topsail downhauls were manned a great change had come over the scene. Darkness had given way before an almost continuous play of lightning, distant as yet, but steadily approaching, as the low thunder growls testified.

Still the wind did not come; the sails, though sodden and stiffened with rain, flapped only to the roll of the ship as she moved to the increasing swell. Some of the younger men were disposed to make a joke of furling in such conditions, but were quickly silenced by the more experienced.

"When the wind comes," warned Hayes impressively, "it will be like a cannon shot. Anything this hooker's got on her is likely to go, and if there's much showing the masts 'ul go with it. So save your breath, you'll find it hard enough to keep breathing in what's coming."

Sobered by the old man's earnestness the scoffers worked well, slight puffs of wind proving there was no time to lose.

On deck, again, the main-topsail halliards were started, but before the yard was halfway down the rattle of the blocks changed to a shriek, then ceased altogether.

"That cursed splice has jammed," bawled Mr. Jennings. "Put beef on to your downhauls and drag it through."

At imminent risk to themselves, he and Big Hansen worked with heavers, shaking up the parts of the tackle, in an effort to get it to run, and were on the point of using an axe when the captain joined the group.

"Aloft and stow the sail as it is. You've got all hands to do it, and the wind has not come yet. Make her fast with lashings, then unshackle the sheets and stow it properly."

A flash more brilliant than any which had preceded it illumined the entire ship, showing the men clustered at the downhauls, their angry faces turned towards the group by the halliards. The black darkness which followed was full of curses aimed impartially at ship, owners, captain and gear. The sharp crackling peal of thunder blotted out their words, and in the ensuing silence the mate ordered all hands aloft, himself leading the way.

Strung out along the yard, the hands had no difficulty in getting up the slack of the sail, when an altercation broke out as to whether it would not be better to cut it away and furl it on the lower topsail yard. Thunder, in short, sharp crashes, drowned the voices of the mates. Orders, partly heard, were misunderstood, and the habit of discipline which had returned in the urgency of the moment was lost again in the war of the elements.

Each lightning flash revealed the vessel as might some great searchlight, showing the hull below with a vividness daylight could not rival. The men noted tiny details of nearby objects which ordinarily they had missed. Even the skipper's upturned face stood out. Anxious for his sail, he remained near the jammed halliards, though he should have been on the poop.

Another instant, and blackness worse than ever descended upon their blinded eyes, whilst the thunderpeal which followed immediately seemed to press upon the heads of all. With the alternating flash and peal, the vivid light and black darkness, it seemed impossible to work; the one blinded and the other confused — almost stunned.

From his position in the slings of the yard, Mr. Jennings noted a strange appearance, and the next flash showed him standing, holding on to the topsail tie, pointing to windward. His words were lost in the crackling roar which followed, but a moment later all hands saw a white line, clean cut on the dark oily sea.

Almost immediately the ship heeled over, her half-furled sail bellied out and the yard lifted, to drop with a jerk as the gust passed. Momentary easing of the tension caused reaction at the jammed splice; the new strands shortened, the old stretched beyond hope of conforming, failed to grip, and tuck by tuck, the splice drew.

Aloft the men knew nothing of this. Stunned by the sudden fury of the wind each was holding on, surprised to be alive, waiting for a second gust or some movement on the part of his shipmates. With that alertness of senses which an emergency brings, sharp ears caught the rattle of blocks, the squeal of the chain tie. Then the yard ran down. Lifts previously hanging loose, swaying to the motion of the ship, tightened suddenly as they took the weight, flinging men off the yardarms as from a giant catapult.

Simultaneously the wind came again; the weather yardarm, downhaul and braces slack, flew upward and forward, lifts and parrel parted, and the yard, with men upon it, crashed down upon the crane, ripping the lower topsail. For an instant it hung poised, its every bolt and band distinct in the lightning's flare, then fell end downwards, tilted to the ship's listing and dropped, crushing the bulwarks. Its lower end, which had pierced the deck, ripped up the planks as it broke free, leaving a jagged hole, and the spar itself, its outboard portion with such rags of sail as remained, hung alongside, held by a tangle of gear.

Within ten seconds a ship's crew had gone. Two survivors, captain and helmsman, clung to the wheel in an endeavor to get the ship under control. All after sail gone, she could not be brought to the wind, and yards braced sharp up prevented her being run before it, whilst the drag of yard and canvas almost neutralized helm action.

With astonishing rapidity the sea rose; water spilled over the weather rail rushed to leeward to pour through the torn deck. Little by little the motion of the ship changed, the dips to leeward became more pronounced, recoveries rarer and less certain.

In desperation the helm was jammed hard down, in an effort to shake her free; sluggishly she answered. The list became less pronounced as she pointed up until the fore lower topsail shivered and blew to ribbands. Relieved of its pressure she lurched to windward, water both on deck and below surged across, to rush back again as a sea lifted her bow, and leaped over the rail.

For a moment she stood upright, water bulwark-high fore and aft, then fell over to leeward, cascades spouting from every wash port. Then, steerageway gone, she lay helpless in the trough of the sea, lee side a mass of white water as wave after wave broke across the deck.

Mechanically the two survivors gripped the spokes of the wheel, their whole attention concentrated upon the weather. It was useless, but they had no thought of leaving. No words passed; both knew a pampero did not last long and hoped the *Larrel* would live through it. Already the squalls were less frequent, had lost much of their force, but when the ship heeled before them she failed to recover fully as they passed. Lower she dipped, her lee rail under, the water reaching nearly to the main hatch, the ripped deck planks visible only as she lurched.

At dawn the wind dropped to a light air and, free from its steadying pressure, the crippled ship commenced a heavy and ungainly rolling. The water below gave her a strange irregular movement — a sluggish life — which never reached the vertical, being followed by a sudden fall to leeward. With each lurch the feeling of lifelessness increased until at the end of her downward sweep the *Larrel* paused, very slowly commenced to right herself, then with dramatic suddenness gave up the struggle — and another name was added to the list of missing ships.

One of the early launchings in New England waters was that of the power cruiser *Harriet*, from the yard of her designer and builder, F. D. Lawley, Inc., Quincy, Mass.

New England Yachting Season Opens

By William Upham Swan

THE yachting stage is set for New England's greatest season, with more actors than ever before in the history of the country's most popular racing and cruising ground ready to play their parts, either in competitive effort or leisurely relaxation. Most of the regatta committees announced their schedules in May and some of the more forehanded in March and April. Many clubs went into commission late in May and early in June, but it will be well into July before the entire coast, from Greenwich to Bar Harbor, is fully mobilized.

Launchings were of course the order of the day in every yard, and fully half the 1927 creations were in commission by early June. Among those which went overboard early in May were Harry S. Leyman's 90-foot ketch *Istar*, and Robert Saltonstall's 75-foot ketch, *Arbella*, both Alden designs, at the George Lawley & Son Corp'n; Charles A. Root's 65-foot power cruiser *Toorac*, built by Parkhurst at Onset from designs by Fred W. Goeller, Jr.; Charles H. Jones's raised deck cruiser *Harriet*, planned by F. D. Lawley, and Dr. Randall Clifford's auxiliary schooner *Maui*, from Eldredge-McInnis, Inc., drawing boards, at the F. D. Lawley, Inc., yard; Alexander W. Moffatt's ketch *Houqua*, a Lawson boat and built at his yard.

Down in Maine, the *Malabar VIII* was launched at Hodgdon Bros. and turned up at Marblehead the second week in May, while several others of the Alden fleet took to the water about the same time in Maine yards.

The outstanding event of the early season was the motor boat parade and demonstration at Marblehead on April 19th, known in Massachusetts as Patriot's Day. Nearly 300 members and guests gathered at a preliminary opening of the Corinthian Yacht Club and, as the harbor was practically free of boats, all hands were thrilled by the antics of Sea Sleds, Hackers, Dodge Water Cars, Chris Craft boats, Baby Gar Jrs., Baby Steppers with Johnson outboards, a couple of the Onset Class and a Chaisabout with a Ford motor.

The day was an ideal one, as warm as late June, with scarcely a breath of air. The sail boat men watched the speedsters cavort about the harbor, which has been devoted almost entirely to canvas-propelled yachts for half a century, with generous equanimity, but steps were taken soon after to limit the speed inside of Marblehead Rock to 15 miles an hour for the protection of the youngsters and to prevent heavy rolling by the smaller craft at the head of the harbor.

The Marblehead visitation, and the Gold Cup Ass'n regatta in Boston, the 17th and 18th of this month, has given the motor boat industry a tremendous boom in New England, and the Boston dealers not only sold many boats, but a number opened branches in well known ports, such as New Bedford, Marblehead, Portland, Rockland and Bar Harbor.

The racing of sailing yachts began on March 19th, the earliest date ever known in New England, by the Sailing Section of the Union Boat Club in Charles River Basin, and by June 1st nearly a score of contests had been held by the little 12-footers. The fleet will continue through the summer and fall, with the final event on Thanksgiving Day.

Speed boat racing also started early with several events for smaller craft held by the New Bedford Yacht Club at its Padanaram station in May, followed by other clubs later in the month.

The Marblehead season opened on May 28th, with an impromptu regatta by the Corinthian Yacht Club, followed by two the next week by the Eastern Yacht Club. The regatta committee of the Eastern Yacht Club will have a class for the new 10-meter boats in its races off Marblehead in June, and for the runs on the annual cruise which starts on July 5, and which will be confined this year to the southern half of the Gulf of Maine, the fleet visiting Rockport (Mass.), Portland, Isles of Shoals, Gloucester and Provincetown before the return to Marblehead. The Provincetown visit is on July 10th, so that the Long Island Sound boats will have plenty of time to slip through the Cape Cod canal and haul out for the Larchmont races the following week.

The Marblehead season for smaller classes, from the Bar Harbors to the Brutal Beasts, will be a repetition of that of previous years, the Corinthian Yacht Club holding twelve and the Eastern Yacht Club nine championship events between June 11th and September 17th. Both Clubs will give Sunday races, and the Corinthian will hold events for small boats on Wednesday afternoons.

(*Continued on page 100*)

Yachting on the Other Side of the Atlantic

The Season to Get Under Way Early in June—New Twelves and Sixes

By M. Heckstall-Smith

OUR yacht racing season here starts on June 4th, in the Thames estuary, with the regatta of the Royal Thames Yacht Club. The big vessels will not be racing until later, but the International 12-meter class should be there in force.

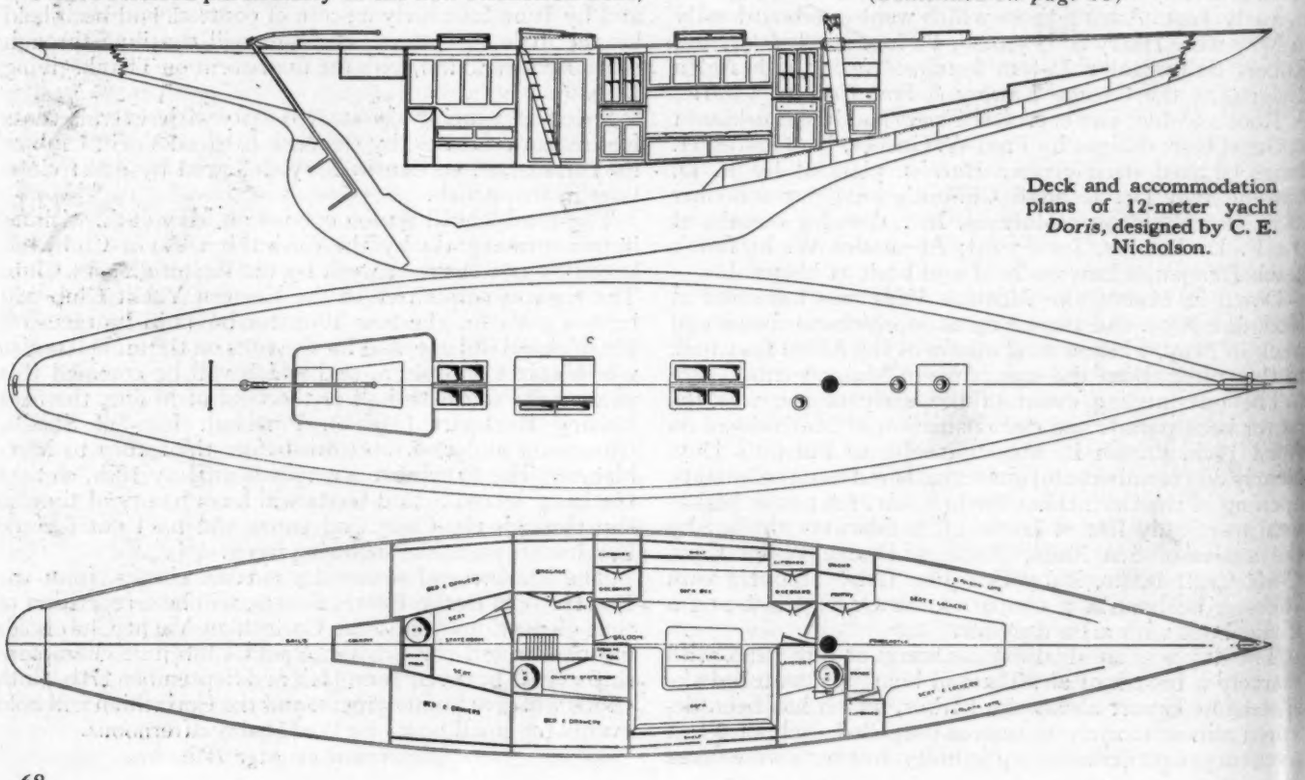
The chief interest of the meeting will center around the performance of the two new "Twelves" which are being built by Nicholson, for Sir William Burton, and by Fife, for Mr. Lauriston Lewis, the owner of the crack 6-meter *Zenith*. I have had the pleasure of going over the Nicholson yacht in her building shed at Gosport and from what I could see of her — it is not easy to get a good view of a boat at such close range — I should say that she will turn out to be a faster vessel than *Doris*, Nicholson's last season's "Twelve." The new craft appears to have a little less beam than *Doris* and to have her diagonals even more cleanly carried out. She has ample freeboard for her displacement. I do not, of course, know the exact figure, but it is well below the ridiculously high limit which has lately been fixed by the International Yacht Racing Union.

It is never wise to predict the future of a new racing yacht, but I am tempted to do so in the case of the new Nicholson craft. She will, I think, prove to be a first-class all-round performer and to be quite at her best in heavy going weather work. I am strengthened in this opinion by a remark of Nicholson's during a lecture he gave some years ago on yacht designing. He told us that one of the secrets of successful design of a racing yacht was the selection of a really capable owner. In the design of the new "Twelve" this condition has been fulfilled as, in the Vice-President of the Yacht Racing Association, she will have a helmsman second to none on this side of the Atlantic.

I have referred particularly to the new Nicholson boat, as I consider that she is a fine example of the type of yacht produced under the International Rule when "extremes" are avoided and refinement of design is the outstanding feature. The new yacht is about 42 feet 6 inches on the load water line, 12 feet beam and 8 feet 6 inches draft, with a displacement of nearly 21 tons and a sail area of a little over 2,000 square feet. I have not yet seen the Fife yacht, but should imagine that she does not vary much from the above dimensions. Being a "Fife," she, too, is certain to be a good boat but, so far, Fife has not been able to beat his first "Twelve," *Vanity*. This yacht, in her fourth season, could hold her own and, in her own weather, more than hold her own with last season's Fife boats, *Modesty* and *Moyana*, Nicholson's *Doris* and the Anker-designed *Noresca*.

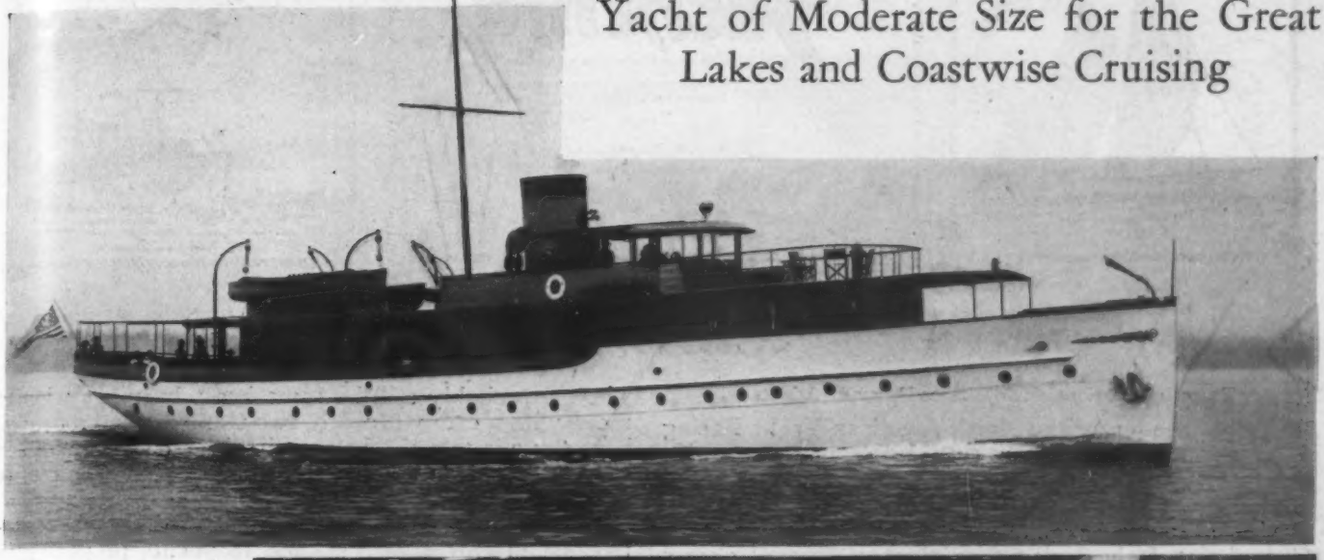
Under the present International Rule, it is no easy task for designers to outclass existing craft. Speaking generally, on experience gained during the last four seasons' racing, it may be said that it is in refinement in design rather than in abnormal dimensions that future development may be looked for. There is, however, one exception as regards dimensions. The strong tendency towards abnormal freeboard which has made itself felt in recent design, in the six-, eight- and twelve-meter classes, is highly objectionable. Good freeboard in a yacht, either racing or cruising, is a feature in design much to be desired, but one can have too much of a good thing, and I am very doubtful if the recently adopted limit is adequate. In view of the fact that the North American Yacht Racing Union has adopted the six-, eight- and ten-meter classes, I think it possible that American yachtsmen may be interested in the plans of *Doris*, which, by the courtesy of Mr. Charles Nicholson, I am able to send. From these plans, which I regard as ideal for a small cabin racing

(*Continued on page 88*)



Deck and accommodation plans of 12-meter yacht *Doris*, designed by C. E. Nicholson.

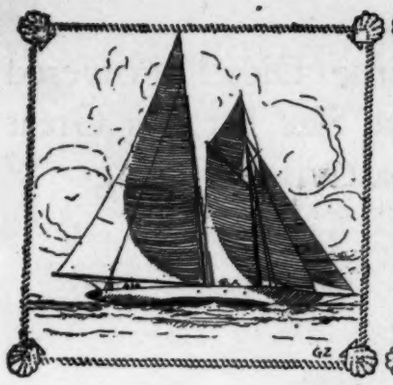
Sylvia — A Modern, Diesel Powered Yacht of Moderate Size for the Great Lakes and Coastwise Cruising



Sylvia, designed by John H. Wells, is an example of a comfortable cruiser of moderate size. She is owned by Logan G. Thomson, of Cincinnati, and is 133 feet in length. She was built by the Defoe Boat & Motor Works.

The main saloon, or living room, in the deckhouse, has the roominess, comfort and charm usually found heretofore only in much larger yachts.

Below (left), the two 6-cylinder Bessemer Diesel engines of *Sylvia*. Right, the spacious after deck with shelter seat in after end of deckhouse.

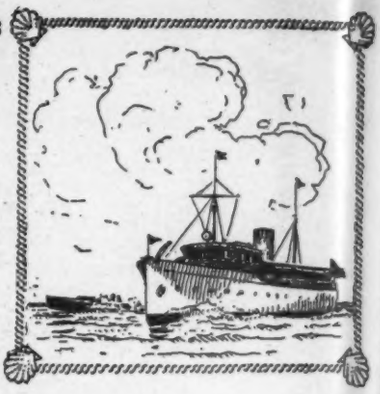


Yachting

HERBERT L. STONE
Editor

SAMUEL WETHERILL
Associate Editor

EARLE D GRIMM
Publisher



Editorial

Three International Rule Classes Formally Adopted

AT the meeting of the North American Yacht Racing Union, held in Chicago April 30th, and attended by delegates from most of the yacht racing bodies in the United States and Canada, the final stamp of approval was given to the recommendations of the Measurement Committee of the Union, and three additional classes were formally recognized for this continent, namely the 6-meter, 8-meter and 10-meter classes, under the International Rule as amended on the request of the Americans at the meeting in London last winter. This action does not interfere in any way with the present Universal Rule in use here, which still stands, but it gives those desiring to build a choice of either the International Rule, in certain classes, or the American Rule.

We believe that the action taken was both wise and far-seeing, and will have a stimulating effect on yacht racing and building in this country. It was also conservative, in that it did not attempt to supercede the present rule in force here, by either a new or modified rule, or by substituting for it the International Rule. With the building up of the three new classes under discussion, as we predict will happen under the stimulus of international racing, we will soon be in a position to judge the merits, under conditions here, of the yachts produced under each rule. The development of the boats themselves will decide which rule will "have the call" in the future.

All sections of the country were represented at the meeting except Marblehead, and the new classes were unanimously approved. It is to be regretted that Marblehead yachtsmen were not represented.

To Clifford D. Mallory, President of the Union, and to W. A. W. Stewart, Clinton Crane, Sherman Hoyt, Henry L. Maxwell, and the others associated with them, great credit is due for at last bringing into being a national organization of American yachtsmen that should do much for the upbuilding and standardization of yacht racing here.

Changes in Mackinac Race Classifications

With the splitting of the fleet in the Chicago Yacht Club Mackinac Race into a racing and a cruising class it looks as if the dissatisfaction apparent in these events during the last few years may be eliminated. Under the old deed, small Universal Rule yachts seemed to be "copping" all the prizes in a race promoted primarily for cruising yachts. Now, it appears, an additional cup will be put up for this event, of equal importance to the famed Mackinac Cup, and the two types of yachts will be raced separately, but over the same course and at the same time. No more will the little, light-displacement racer invade the domain of the cruiser — provided, however, that the committee can decide the knotty question as to what is a cruiser and what is a racer. There'll probably still be some heart burnings when a racer, with a cuddy forward, two transoms and a canned heat stove is told she belongs in the racing class, when her owner is looking for easy pickings among the cruiser fleet.

At any rate, all hands now seem satisfied, and the tentative list of entries shows some 18 yachts preparing to enter the racing division and 14 casting covetous eyes at the first prize in the cruiser class. A big fleet is assured by the new ruling.

When Extremes Meet

The season at hand is to produce two of the most interesting and radical experiments in design that have been seen for many years. The net result may have a far reaching effect on yachting. One of these, built under the Universal Rule for Charles A. Welch, 2nd, is from the fertile brain of L. Francis Herreshoff, and was described briefly in the last issue of YACHTING. He makes use of a revolving mast, double luffs on the sail, a spar for a headstay, and certain unusual features of hull design that should make her the most discussed yacht of the year. Those who have seen her in the shop say she should be fast and should have no trouble in disposing of her competitors. Time will answer that question.

The other, designed by C. Sherman Hoyt under the International Rule, for himself and H. L. Maxwell, is fairly normal as regards hull design, but her rig is something that will make your tradition-bound shellback gasp in amazement. With a mast set well aft, a jib twice the size of the mainsail, a cockpit forward of the mast and "backstays" leading forward, there is plenty of room for speculation. With a touch of humor, she has been named *Atrocia*. It is a bold experiment and one full of possibilities — good or bad, as you want to view it.

After hearing these two yachts described at length, Commodore Gooderham, of the Royal Canadian Yacht Club, has offered the pertinent suggestion that they be purchased and mated to see what kind of breed would come of the union. Scientifically, it would be interesting.

Any way you look at it we are in for an interesting summer, and we will all know a lot more about what is possible under existing rules by September than we know now.

Diesel Power in Yachts

Within the last ten years the Diesel engine has practically displaced every other type of power for large yachts, both in full powered and auxiliary vessels. Therefore, in this issue of YACHTING it has seemed fitting to let those pioneer naval architects who have done so much to introduce the Diesel engine to yachtsmen tell of the development in yacht design that this comparatively new type of power has brought about. It is a story that intimately concerns every yachtsman.

In the World of Yachting

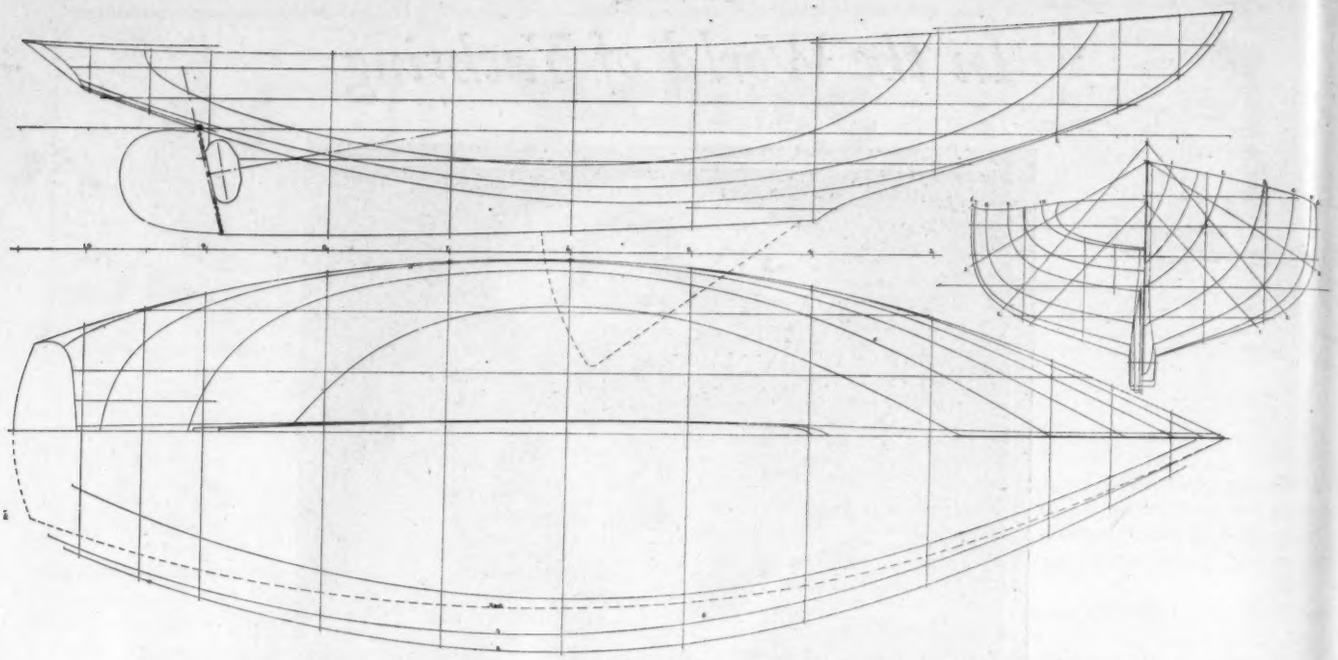
OWEN P. CHURCHILL

THE subject of our sketch this month, Owen P. Churchill, is one of the best known skippers on the West Coast, where most of his sailing has been done, although he has also been seen in the East, where he took part in one of the earlier International Star Class series sailed on Long Island Sound.

One of the younger sailors that the sport has produced since yachting became popular in Southern California, Owen Churchill started his racing career in the Star Class shortly after that popular international one-design class made its appearance on the southwest coast of the United States. When the first International Star Class series was sailed in 1922, he came East and sailed that year in "Three Star," which, with Ben Weston at the tiller, finished in second place. After owning and sailing several Star boats in the next few years, he went into the R Class, where he has raced ever since, his last "R" being the "Galliano IV," a new yacht designed by "Ted" Geary, in which he finished second in the recent Mid-Winter series of the Skipper's Club.

As Commodore of that lusty young organization, Owen Churchill is working hard to make winter racing in Southern California an international affair, and with other members of that club, and Clifford D. Mallory, a program is being worked out for next winter that will bring the East and West together in the Six-meter and R Classes, and will possibly include also a European Six-meter entry. Under the stimulus of entries from the East, the Skipper's Club is building several "Sixes," while other yachting centers on the Coast have promised to build to the class. The Commodore has also sent invitations to all Class R owners to send boats west to meet the fine fleet of "R's" in California waters.

He owns, in addition to the "R," the power cruiser "Josephine II," and besides his Skipper's Club affiliation he is Vice Commodore of the Southern California Yachting Association.



An Attractive Shoal Draft Auxiliary Cruising Yawl

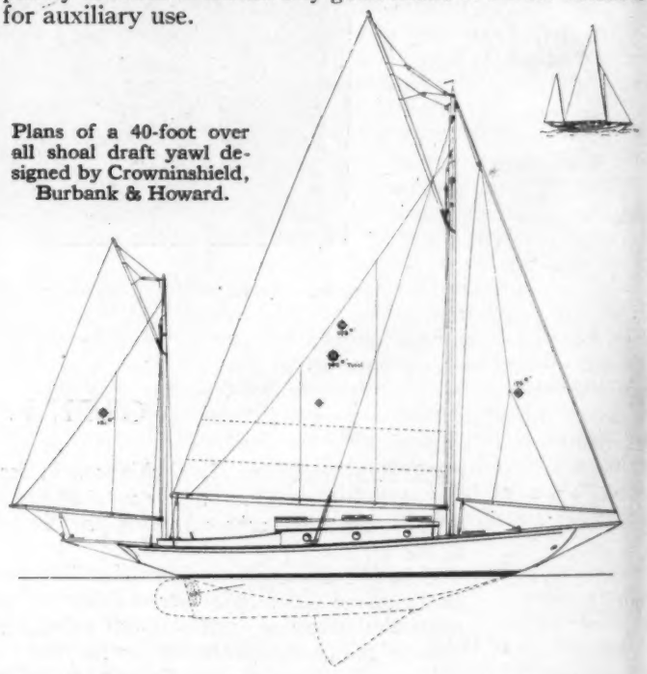
IN response to an increasing demand for cruising auxiliaries of moderate draft, Crowninshield, Burbank & Howard, naval architects and yacht brokers of 31 State St., Boston, Mass., have worked out the accompanying plans of a 40-foot over all yawl which should prove attractive to yachtsmen whose sailing is done principally where the water is spread out a bit thin.

Unlike many shoal draft craft, the beam is not excessive, being only 11′ 6″, stability being gained through a flat floor, hard bilges and outside ballast of 4000 pounds, the latter feature making her uncapsizable. The freeboard is good and the sheer easy and sweet, the ends being kept moderate. The fore and aft lines show a form which should be readily driven in average weather by the yawl rig of 955 sq. ft. The rig is so proportioned that she should handle excellently under various combinations of sail, such as mainsail alone, jib and mizzen, or reefed mainsail and jib and mizzen. While the gaff rig is shown, the hull lends itself equally well to a jib-header should it be preferred.

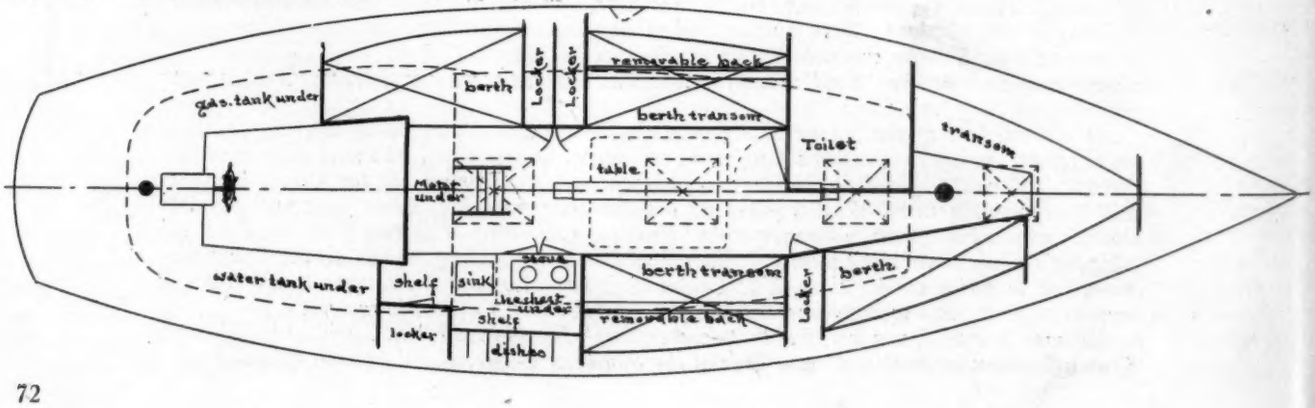
The cabin is laid out to accommodate four in comfort, and is what might be called an "offset" arrangement, with main cabin amidships, a quarter berth on the port side, and another berth forward to starboard.

A sizable and well equipped galley is situated on the starboard side aft, abreast the companion steps, where there is least motion and plenty of space for the cook to pursue his culinary operations. An enclosed toilet room is placed just forward of the main cabin on the port side, and there is plenty of locker and storage space throughout.

The motor space is aft, under the bridge deck, with plenty of room to install any good make of motor suitable for auxiliary use.



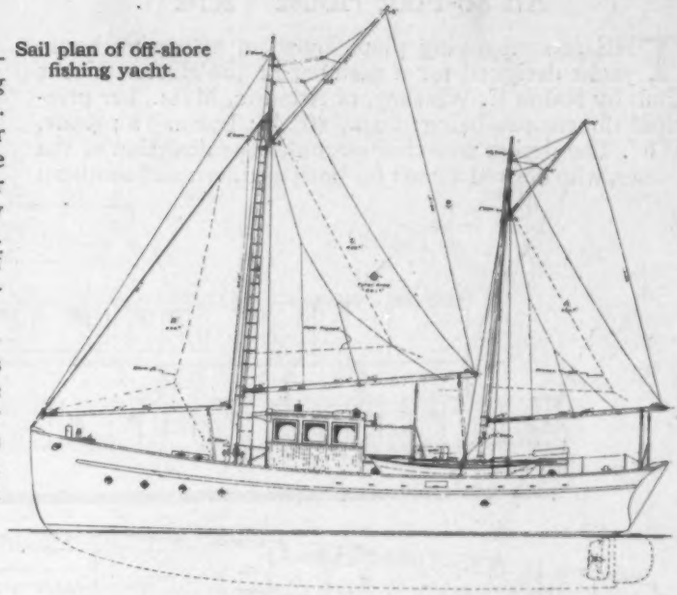
Plans of a 40-foot over all shoal draft yawl designed by Crowninshield, Burbank & Howard.



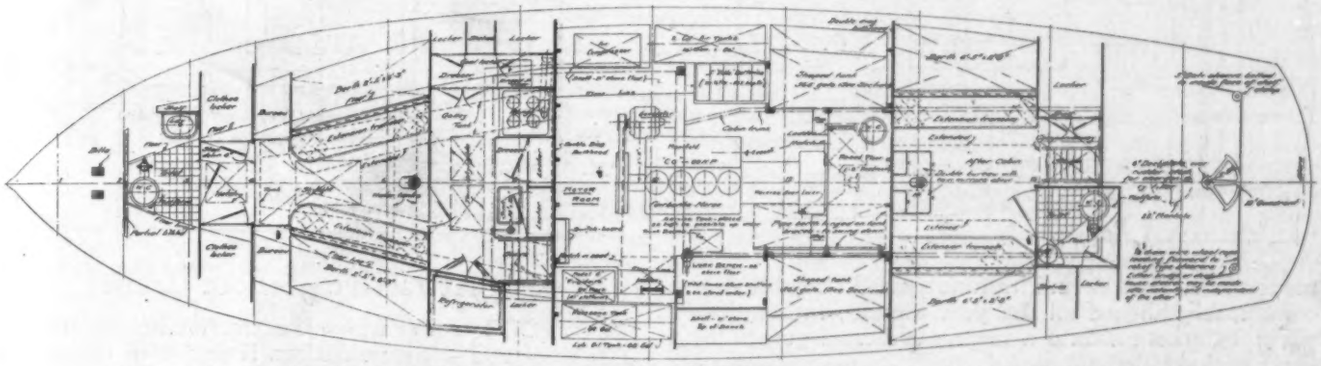
A Yacht for Deep Sea Fishing

COLONEL Edwin M. Chance, the well known sportsman of Philadelphia, owns this most interesting departure from the modern trend in yacht architecture. *Nor'easter*, as she is called, in lines, construction, power plant and rig, is essentially a dragger fisherman of the size and type now so successfully employed in the flounder fishing industry on Georges Banks. She was designed by W. H. Hand, of New Bedford, and built by Chas. A. Anderson, of Wareham, Mass., and is a fine example of husky, serviceable design and construction. Her dimensions are: l.o.a. 59′ 3″; beam, 16′; draft 5′.

The power plant is a 4-cylinder 60 h.p. Fairbanks-Morse semi-Diesel motor, installed amidships. Fuel is carried in two steel tanks totalling 1130 gallons. The motor room is large, and includes everything necessary for long, hard trips to the Gulf Stream some 200 miles from Barnegat, N. J., which Col. Chance will use as a base. Ample accommodations for eight people are found below decks, the deckhouse serving as a dining saloon.



Sail plan of off-shore fishing yacht.

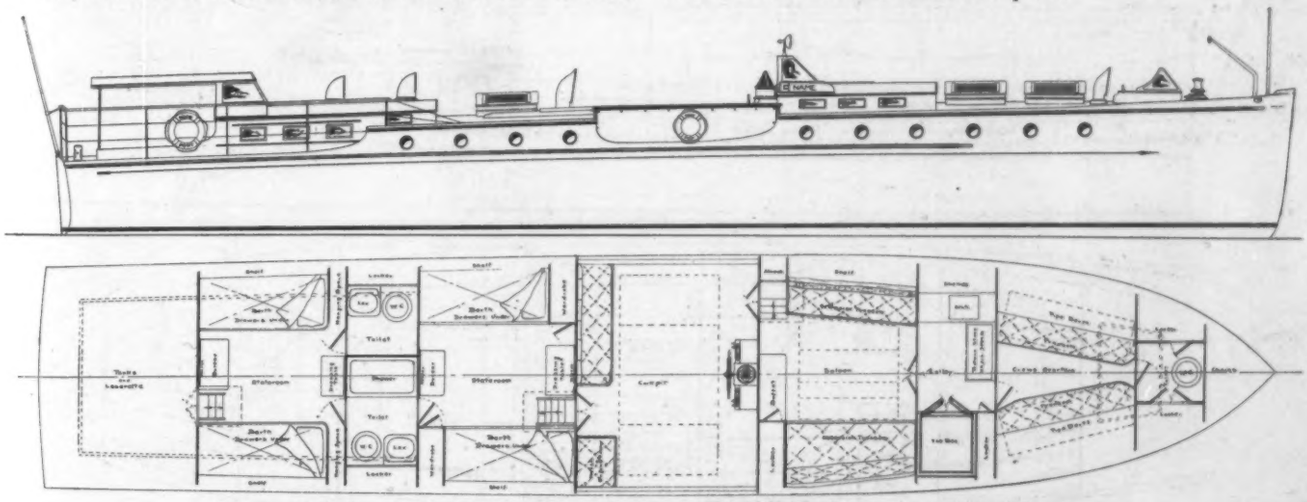


Accommodation plan of 59-foot off-shore fisherman designed by William H. Hand, Jr., for Colonel E. M. Chance.

A Fast Commuter with Unusual Profile and Accommodations

A FAST commuting boat with a style all its own is shown in the accompanying plans from the board of Leonard M. Richards, naval architect of Philadelphia. The designer has endeavored to produce a boat whose appearance will distinguish her from the average run of such craft, and at the same time incorporate some real accommodations which would make her suitable for cruising. She is 62 ft. over all, with beam of 12 ft. and draft of 3 ft. 1 in. Powered with a pair of Wright Typhoon motors, the designer believes her capable of a steady 40-mile clip, and a possible maximum of 45 miles.

The available space on deck is found in two cockpits, one amidships and the other aft. Below decks are crew's quarters, galley and saloon forward, engine compartment amidships, and two double staterooms, two toilet rooms and shower bath in the after part.



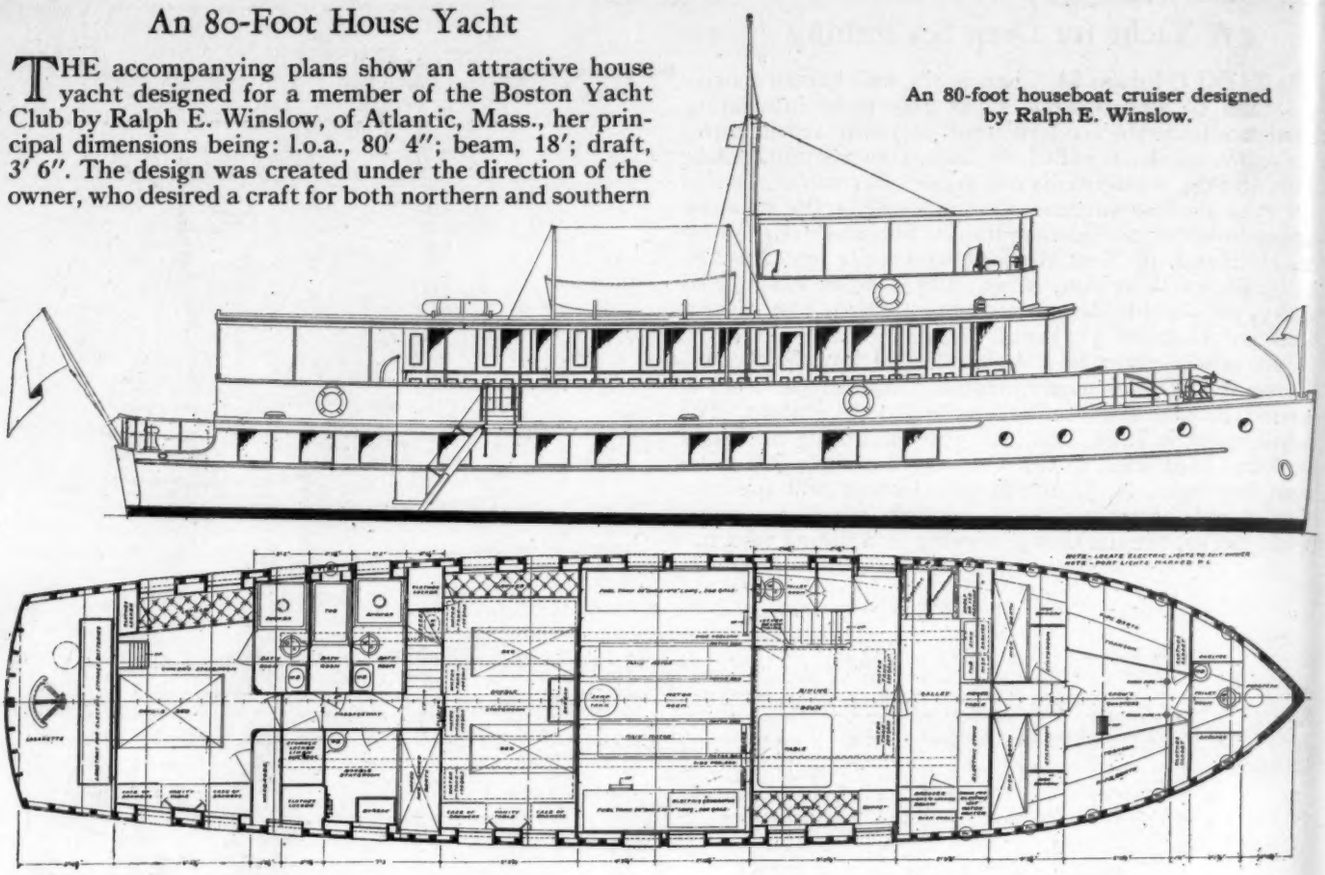
Plans of a 62-foot express cruiser with a speed of 40 miles, designed by Leonard M. Richards.

An 80-Foot House Yacht

THE accompanying plans show an attractive house yacht designed for a member of the Boston Yacht Club by Ralph E. Winslow, of Atlantic, Mass., her principal dimensions being: l.o.a., 80′ 4″; beam, 18′; draft, 3′ 6″. The design was created under the direction of the owner, who desired a craft for both northern and southern use, and one that he and his family would be able to live comfortably aboard all the year around, rather than a yacht to accommodate a large number of guests for a short period.

The arrangement plan shows a practical and livable arrangement for the owner's party and crew. The large motor room will contain a pair of 6-cylinder, 75 h.p. Murray & Tregurtha heavy duty motors.

An 80-foot houseboat cruiser designed by Ralph E. Winslow.

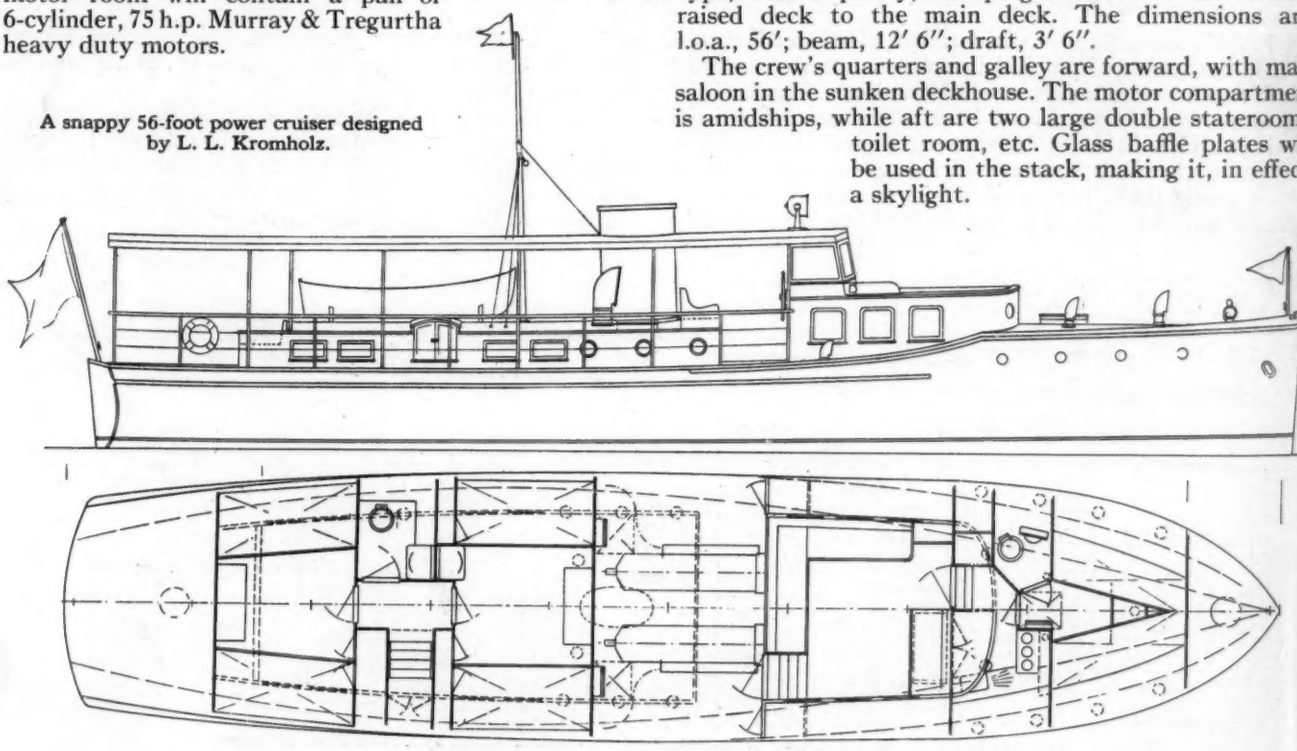


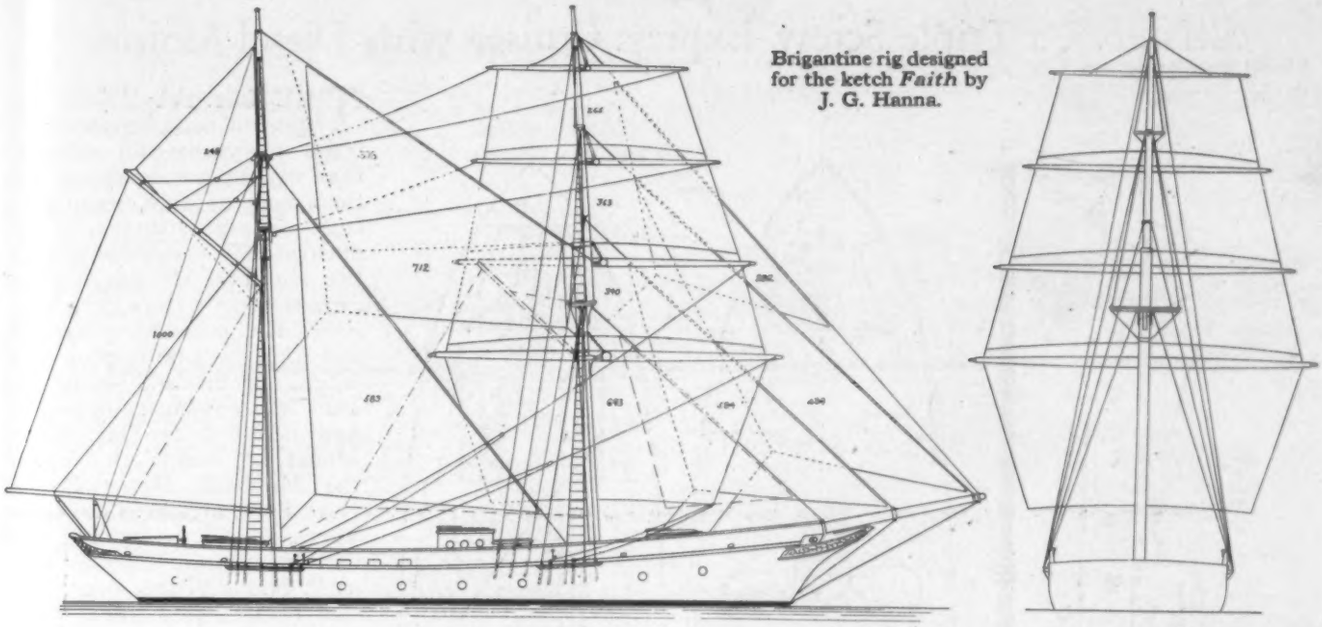
An Attractive 56-Foot Cruiser

A 56-FOOT cruiser which is attractive both in appearance and accommodations is shown in the accompanying plans from the board of Louis L. Kromholz, naval architect of New York City. She is of the "stack cruiser" type, with a pretty, sweeping sheer from the forward raised deck to the main deck. The dimensions are: l.o.a., 56′; beam, 12′ 6″; draft, 3′ 6″.

The crew's quarters and galley are forward, with main saloon in the sunken deckhouse. The motor compartment is amidships, while aft are two large double staterooms, toilet room, etc. Glass baffle plates will be used in the stack, making it, in effect, a skylight.

A snappy 56-foot power cruiser designed by L. L. Kromholz.





Brigantine rig designed for the ketch *Faith* by J. G. Hanna.

A Brigantine Rig for *Faith*

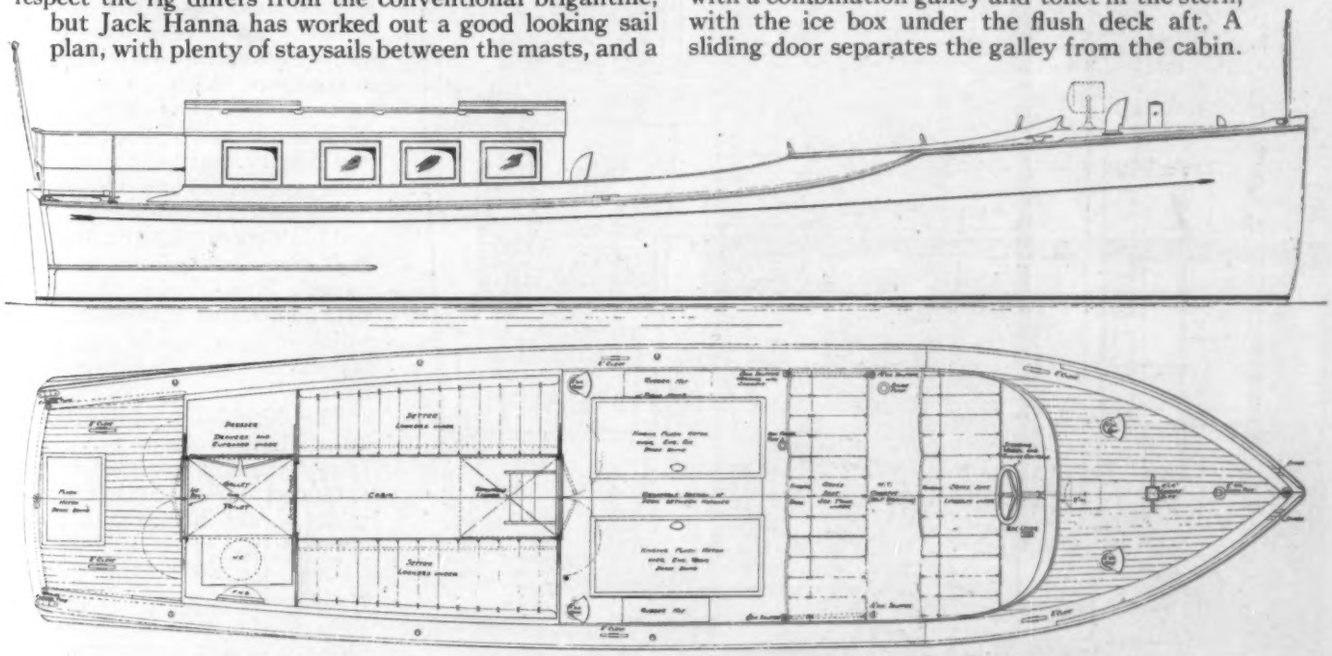
WHEN the 106-foot over all ketch *Faith*, designed by J. G. Hanna for W. W. Shaw, of Chicago, came out last winter, she had a ketch rig. In a voyage from Boston to Florida, and thence through the West Indies to Panama and San Francisco, this rig proved efficient, but in light airs and a heavy swell the booms slatted, as all booms will under such conditions. As the owner intends to do most of his cruising off shore, he has commissioned the designer to get up a brigantine rig for the yacht, and this will be put on at 'Frisco, the last stronghold of square-riggers in this country.

There is no reason why a square rig should not prove satisfactory on this craft, as she has ample beam and stability to carry it, and with the wind abaft the beam it should make her more comfortable. One of the stipulations, however, was that the mainmast should be in the same position as the mizzen in the ketch rig. In this respect the rig differs from the conventional brigantine, but Jack Hanna has worked out a good looking sail plan, with plenty of staysails between the masts, and a spencer gaff on the foremast for setting a storm sail. The total area will be 5554 square feet, the largest unit of which is 1000 feet. There will of course be considerable more windage when under power than with the ketch rig, but she can be handled easily by a small crew.

A Neat Day Cruiser

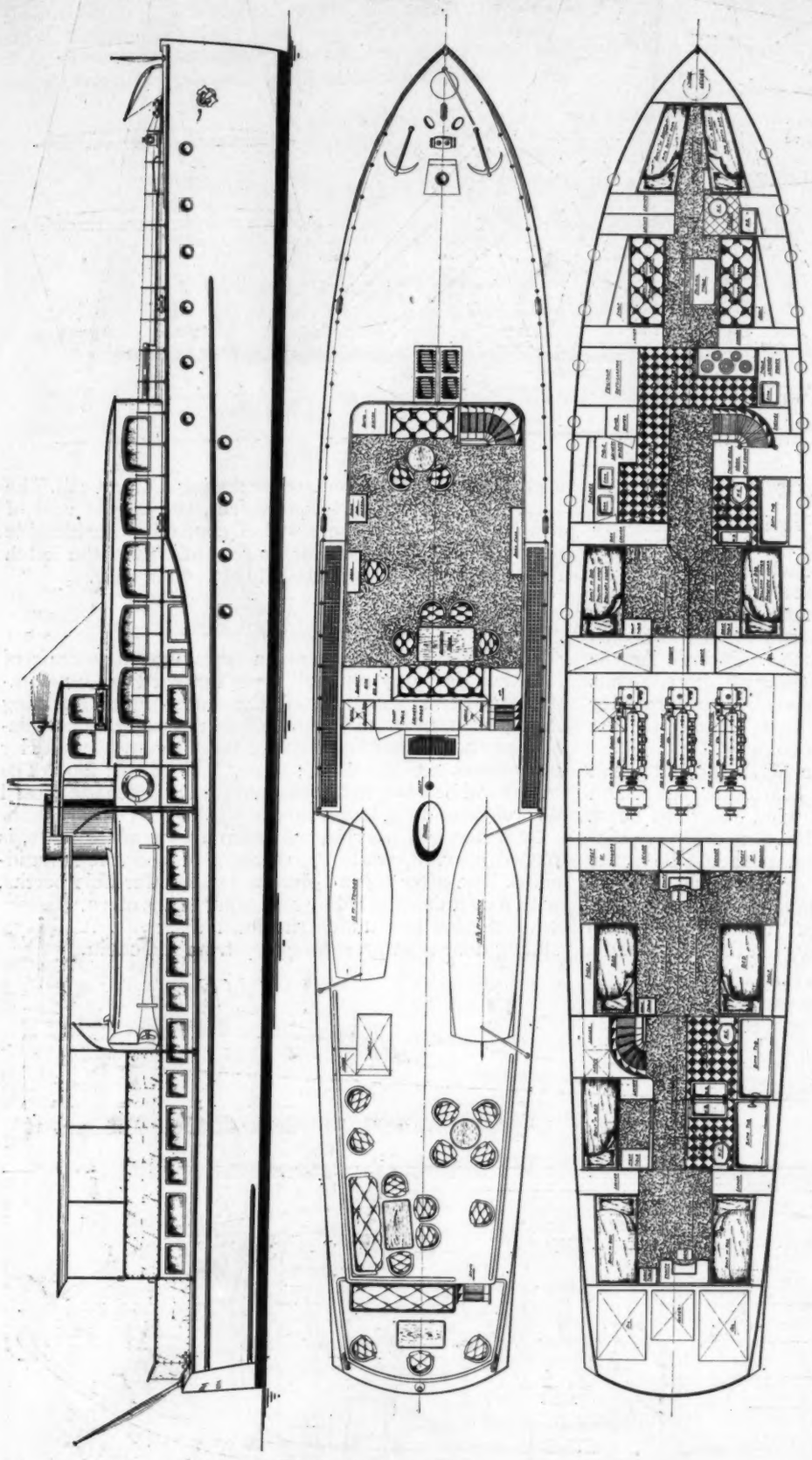
THE plans below are of an attractive little craft of the "fast day cruiser" type, designed for Ex-Commodore Emil Schmidt, of the Inter-Lake Yachting Association, by John G. Alden, and now nearing completion at the yard of Britt Bros., West Lynn, Mass. Her dimensions are: l.o.a 32″; beam, 7′6″; draft, 2′6″. The motor will be a 6-cylinder Kermath, with which she should do well over 20 miles an hour.

A watertight cockpit, with two athwartships seats, is placed forward, while the motor compartment is amidships. The after cabin contains two comfortable berths, with a combination galley and toilet in the stern, with the ice box under the flush deck aft. A sliding door separates the galley from the cabin.



Plans of a novel 32-foot day cruiser designed by J. G. Alden for Commodore Emil Schmidt.

Malaina, a Triple Screw Express Cruiser with Diesel Motors



Plans of a 97-foot, triple screw, high speed Diesel yacht.

THE fact that Diesel motors will soon be popular in types of yachts far different than usually are equipped with them, such as large, ocean-going craft of large tonnage, is well illustrated by the power installation found on *Malaina*, the fast express-type cruiser which arrived in this country last fall, and which will be seen on Long Island Sound and along the coast the coming summer. She was designed for Mr. G. N. Moffet, of New York City, by the Maybach Motor Co., of New York, and Fr. Luerssen of Vegesack, Germany, and built at the Luerssen yards at Vegesack. She is 97 feet over all, 17 feet beam and 4 feet 6 inches draft, the motive power being three 6-cylinder Maybach Diesel motors of 150 h.p. each, installed in a spacious engine compartment amidships.

Malaina has an almost straight sheer, with raised deck forward, sunken deckhouse, raised bridge deck, trunk cabin and short deck aft. The boat has every appearance of speed, the profile being low and symmetrical throughout.

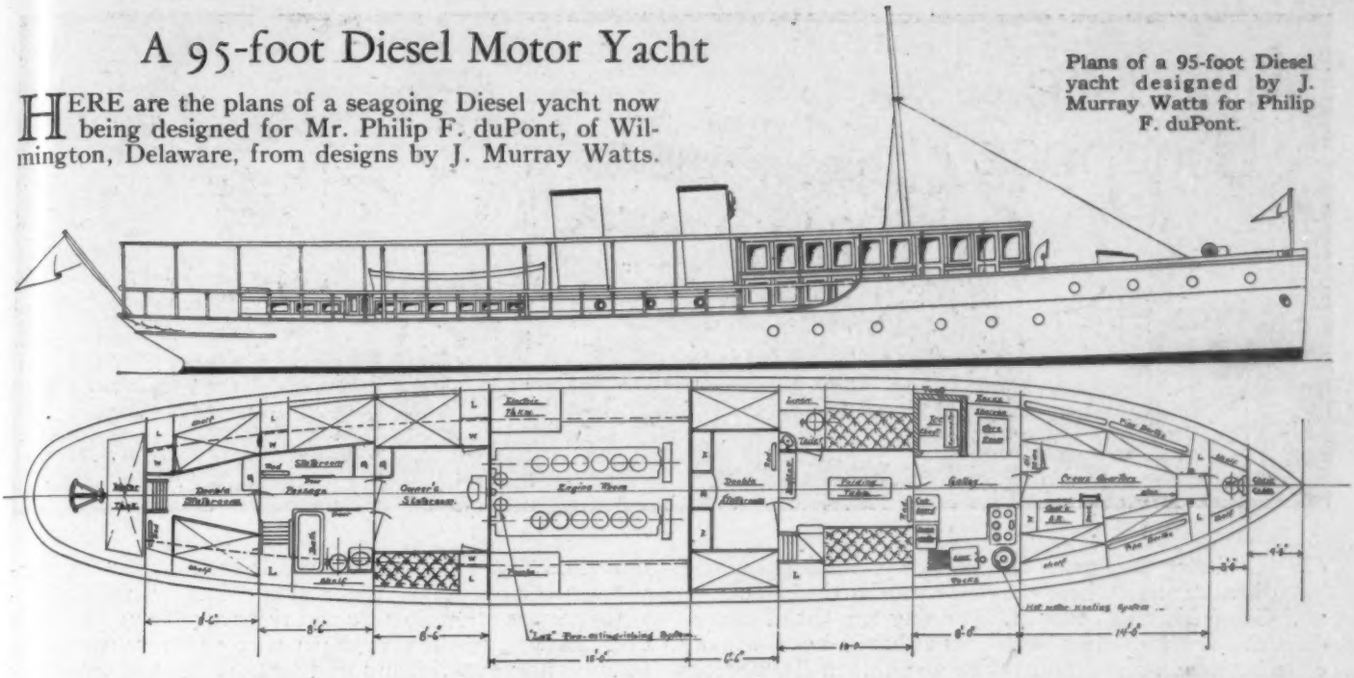
The accommodations below decks are excellent for extended cruising, which is made easy on account of large fuel capacity, economy of operation of the Diesel motors, Frigidaire refrigeration system, and ample storage and locker space throughout.

The crew space forward is ample to accommodate six men in comfort, with toilet room, lockers, etc. Abaft this space is a large and well equipped galley and pantry, partially under the deck saloon, as are two staterooms with connecting toilet and bath room. Abaft the amidship motor compartment is the owner's large double stateroom with connecting bath room, after which come a double and single stateroom and another bath room.

The deckhouse, which is used as a dining saloon as well, is large, comfortable, and well equipped in every way with tables, desks, book cases, radio, Victrola, etc. Access from the pantry to the saloon is by means of a curved companionway, which also leads to the forward double stateroom.

A 95-foot Diesel Motor Yacht

HERE are the plans of a seagoing Diesel yacht now being designed for Mr. Philip F. duPont, of Wilmington, Delaware, from designs by J. Murray Watts.

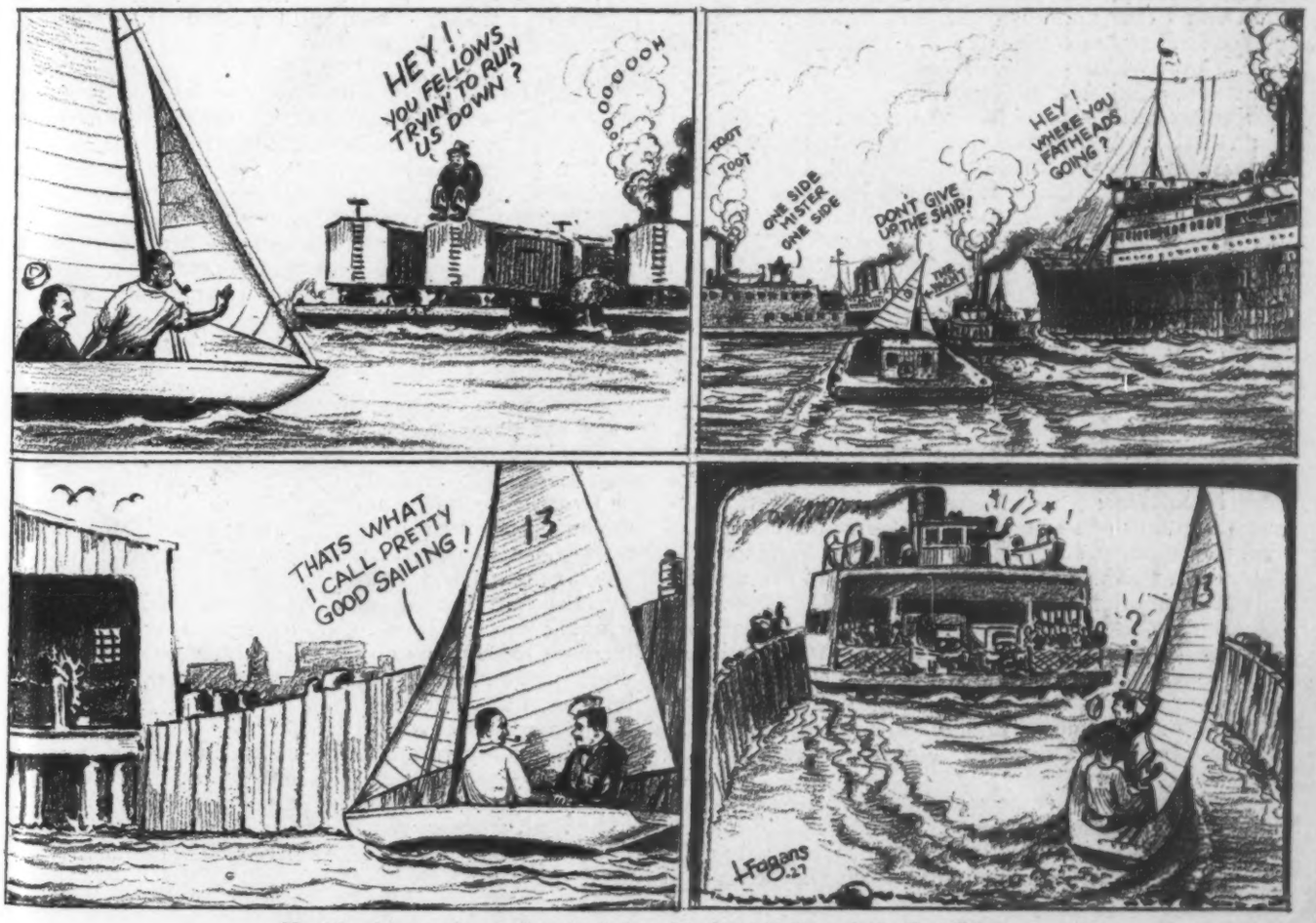


Plans of a 95-foot Diesel yacht designed by J. Murray Watts for Philip F. duPont.

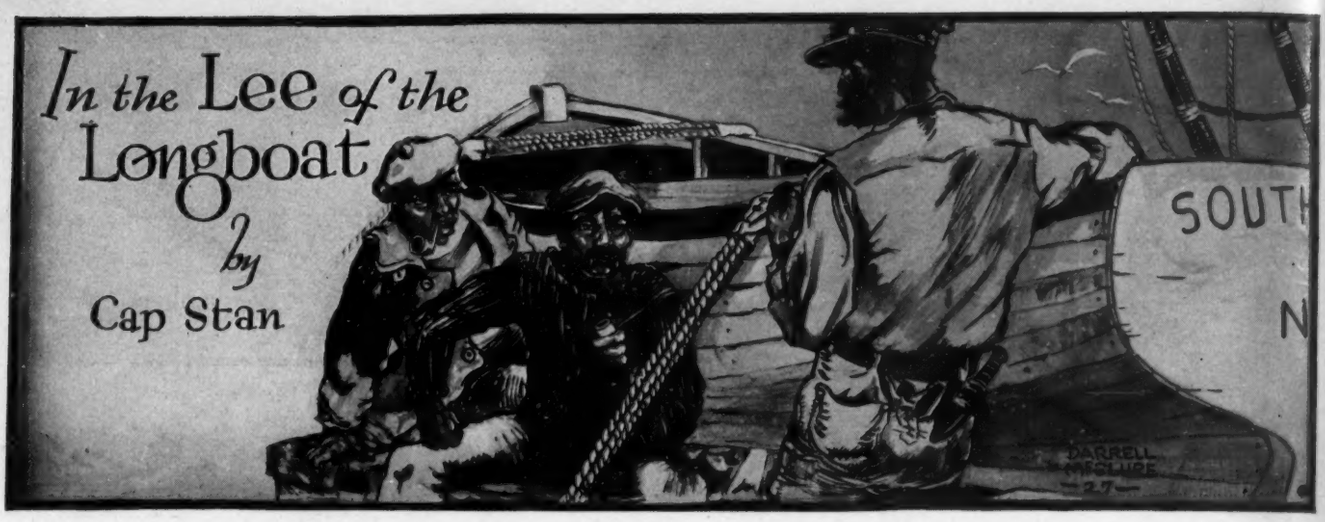
An effort has been made in these plans to get away from the high-sided appearance of many Diesel yachts of this length, and the result shows a long, low, graceful hull with moderate sheer and good freeboard forward, with a pronounced flare to the bow sections. There are two ventilating stacks fitted, which take the exhaust from the Diesel motors and auxiliary engines, and also the smoke pipe from the fireplace in the owner's stateroom.

The general arrangement is shown in the plans and includes a very large deck saloon 22 feet long. The dimensions are: length over all 95′0″; beam 17′0″; draft 5′0″.

In the engine room will be two Diesel engines developing a total of about 400 h.p., and a 7½ Kw. Universal electric plant, which will furnish current for the electric lights, searchlight, running and riding lights, electric ice-making plant, electric capstans for boat hoists, etc.



How the skipper of a small yacht feels on his first trip through the East River.



THIS being the season for pre-race predictions on long distance affairs, here goes for a shot at the Cape May and Gibson Island contests. Scanning the list of entries discloses the fact that both races should be unusually close between several craft, with a couple of dark horses and post entries apt to upset the dope. However, here goes: The Cape May Race should see *Sachem*, *Malabar VIII*, *Malabar VII*, *Teal*, *Fei Seen*, and *Squaw* right up in front. *Squaw* should lead at the finish if there is much windward work, and if she is well sailed, with *Sachem* close behind. If reaching prevails, *Sachem* may lead the fleet, though she may not save her allowance. And if there is much work with started sheets, the big sled *Tanya* may upset everything, providing she starts (which I rather doubt), and also providing she is sailed. *Butterfly* may have something to say about it, at that, particularly if there is much windward work, or much running — the schooners should beat her reaching.

Several of the above are not yet entered for the Gibson Island affair, and several owners of other craft have signified their intention of starting, but have failed to enlighten the committee as to the names of their boats, all of which makes it a big gamble. With the present entries, it looks as though the schooners *Sachem*, *Malabar VIII*, *Fei Seen*, *Malabar VII* and *Teal* would finish in the lead, with *Sachem* and *Malabar VIII* at the shortest odds. Anyone with conflicting opinions, who wants to back those opinions with real, hard cash, is invited to meet me at the Times Square subway station during the evening rush hour one week before the start.

* * *

Those of you who have been reading Dr. Curry's articles on sails, or are in any way interested in learning of the latest improvements in sails and sail trimming, will have an opportunity of seeing some of the Doctor's schemes tried out on one of the new 10-meter boats as soon as the season gets well under way. This boat will have a mainsail cut in an original way, a different kind of jib, or jibs, and an innovation in the manner of trimming headsails. And possibly some other stunts about which I am in the dark at present. If they all work out, as the Doctor seems confident they will, the other boats in the class will have to follow suit or trail the procession. Incidentally, one of the Sound Interclubs will probably try out the trick mainsail.

Another trick rig will be seen on the new 6-meter boat designed by C. Sherman Hoyt. I hear that the mast is stepped well aft, and that the jib is much larger than the mainsail. Still another innovation in rigs will be seen on one of the Class R boats, when it is sprung on her unsuspecting opponents in the middle of the season. Altogether, innovations in sails and rigs are apt to come thick and heavy once the sharks get time to study up on the illuminating experiments and tests of Professor Warner and Dr. Curry.

* * *

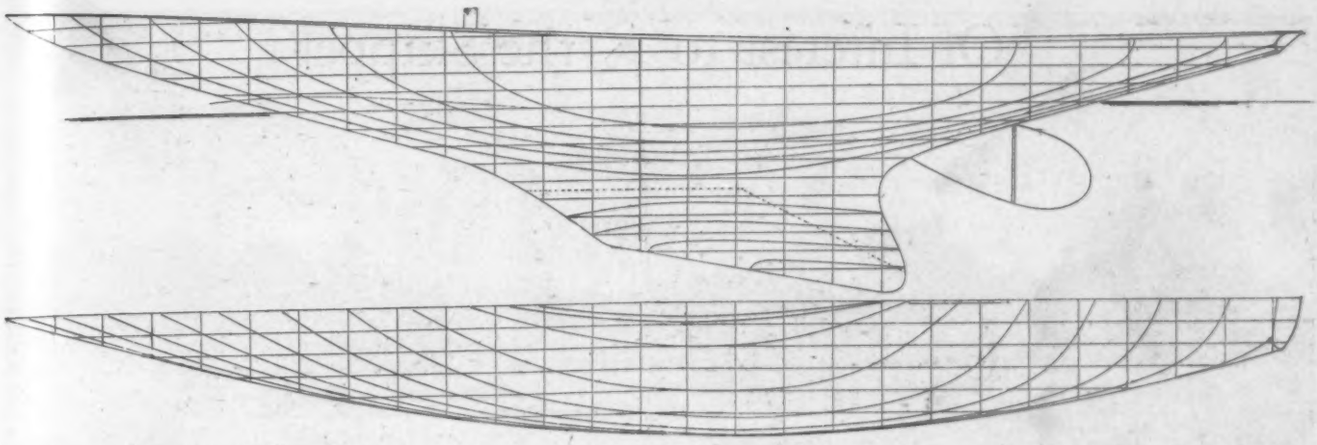
If we are to believe the press dispatches, the Germans will enter the scramble for the Scandinavian Gold Cup some time in September, off Oyster Bay. Which, unless I am mistaken, will be the first time they have entered any international yachting contest since the historic outburst of August, 1914. I have never heard of the Germans having anything to do with 6-meters, and am wondering if they have time to design and build a craft for the contest. We'll see.

* * *

There is a feeling in some quarters that the Bermuda one-design boats didn't quite do themselves justice in the recent match with the Sound Interclubs held in Bermudian waters, and that, given another chance, they might reverse the decision. If the Bermudians themselves feel this way about it, they'll have an excellent chance of proving their point if they accept the invitation of the Interclubs to come up with their boats during Larchmont Race Week and scrap it out in another team race. In typical Long Island Sound weather, it should be a whale of a contest. Let's hope it comes off.

* * *

All racing men, especially those who sail on small craft, know the annoyance occasioned on calm days by passing motor driven craft, whose owners seem blissfully unaware that their craft send out a series of waves which travel half a mile or more, and cause great grief to all small racing craft in their vicinity. It is particularly annoying in a close race, when the wind is a mere zephyr, to have your boat knocked around by these swells, all the wind knocked out of your sails, and, perhaps, your chance of winning knocked into a cocked hat. And with the rapid increase in numbers of the small, high speed runabouts and express cruisers, handled largely by people who know nothing of the water, the situation will soon become acute. Right now is the time for yacht clubs and associations to start a vigorous propaganda for the education of motor boatmen — teach them a little something about the etiquette to be observed when near small racing craft, and in harbors, when swells from power boats are particularly annoying and, at times, positively dangerous. Who'll start the ball rolling?



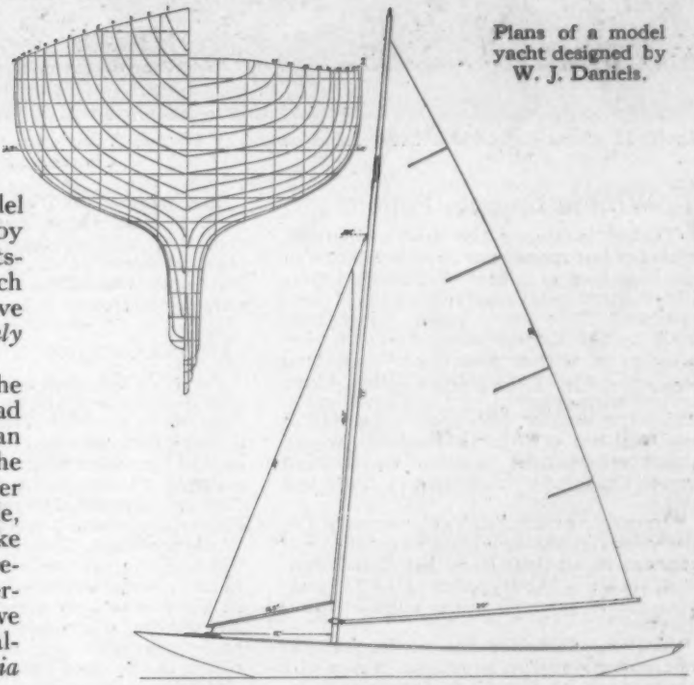
Plans of a Model Yacht to the International Model Cup Rule

WITH the prospect of an entry from the Model Yacht Racing Association of America for the international races to be sailed this summer in Gosport, England, the plans of a new model built to the rule under which these races are sailed will be interesting to model yachtsmen on this side of the water. The design is by W. J. Daniels, one of the foremost British model yachtsmen, who raced here in 1922 with the *Endeavor* which was beaten by the *Polka Dot*. In England his boats have been very successful in the races for the *Yachting Monthly* Cup.

There are several model yachts building here for the elimination races to choose a representative to go abroad this summer. These are mostly the product of American model yachtsmen or designers, and are built under the same rule, which is the *Yachting Monthly* Cup Six-Meter Rule. This rule allows less draft than the American Rule, and the boats produced under it are more nearly like full-sized yachts in this respect. The British boats heretofore built under this rule were larger and more powerful than those built here to the same rule, and, if we remember rightly, both of the previous American challengers, Weaver's *Slipper* and John Black's *Bostonia* had less sail area than is allowed under the rule.

The boat whose plans are shown here is also a large, powerful craft, with plenty of beam, a flat floor and hard bilges for stability. The ends are long, but are well turned and graceful. The rig looks moderate for the hull, but has a rated area of 1890 square inches.

The other dimensions of the hull are: length over all, 72.5 inches, water line, 45 inches, beam, 15 inches, draft, 10.5 inches, displacement, approximately 38 pounds. It will be seen from these figures that she is a very husky craft.



Plans of a model yacht designed by W. J. Daniels.

International Elimination Races to be Sailed on Mystic Lake

HAVING sent a challenge for the international race to be sailed abroad this summer, the Model Yacht Racing Association, in accordance with its practice, has sent invitations to all member clubs to send entries for a series of trial races to be held by the Association to pick an American representative to go abroad. These races will be sailed on June 25th, 26th and 27th on Upper Mystic Lake, West Medford, Mass., under conditions as nearly as possible like those that will obtain at Gosport, where the international races will be held.

Any club that is a member of the Association may enter, and entries should be sent to the Secretary of the Association, Wellington Rindge, 1717 Beacon Street, Waban, Mass. As many clubs in the East have built models with this race in view, it looks as if a good-sized fleet will be at the starting line for these elimination contests.

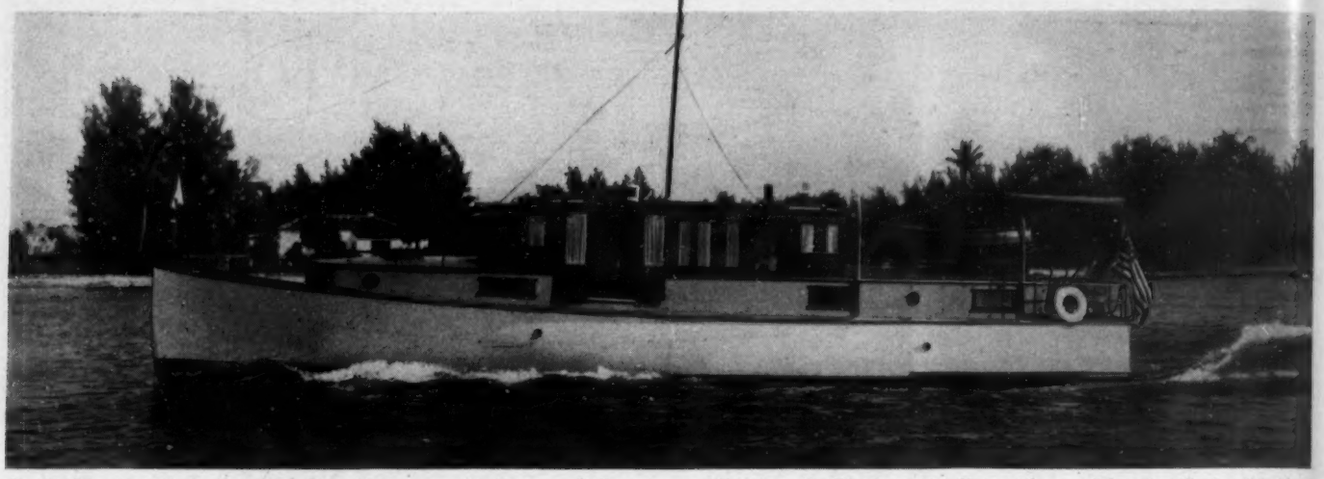
The dates for the international race, to be sailed on Gosport Lake, near Southampton, are July 30th, 31st, August 1st and 2nd. Already challenges have been received from the United States, France, Denmark, Holland and Norway.

Season Opens at Prospect Park Model Yacht Club

ON May 1st, the first Point Race of the season was sailed by the Prospect Park Model Yacht Club at its station in Prospect Park, Brooklyn, N. Y., and racing will continue each Saturday afternoon and Sunday morning throughout the yachting season.

To the 60 models in the club house at the close of last season some eight or ten new models of the "B" Class have been added. Great rivalry is displayed among members owning "B" boats, since from this class will be selected the three contestants who will represent the club in the races for the Eagle Perpetual Trophy, to be sailed off the Bayside Yacht Club, at Bayside, Long Island, on September 18th. The season was officially opened with a regatta on Monday, May 30th.

Of Interest to the Skipper



Lydia II, a new 46-foot Matthews cruiser owned by Thomas J. Corcoran, of Cincinnati. She does 14 miles per hour with a 6-cylinder Sterling Chevron motor.

Winton Engines Popular

Tucked in among the news of current events of last month was an item relative to the launching of a fleet of thirteen 100-ft. Coast Guard cutters, and it is worthy of comment that these sturdy vessels, which were built by the Brown-Boveri Company, are all powered with engines from the Winton Engine Company of Cleveland, Ohio. These motors were specified by the Coast Guard, which has become thoroughly convinced of the qualities of Winton Engines through their performances in other Government vessels under every condition of storm and stress.

From figures supplied by Government Departments it was ascertained that the total tonnage of all American-built Diesel powered yachts is 13,941, and of this 9,563 gross tonnage is powered with Winton Diesel Engines.

The manufacturing and service facilities of the Winton plant have kept in step with the growth of the Diesel marine engine industry and their plant is one of the best in existence. No one disputes the assertion that the steam yacht is about extinct and that the yacht of the future (and of the present) is to be Dieselized, and the Winton Company has been a pioneer in developing the Diesel engine to its present high state of efficiency.

The Winton full Diesel type engines are built in two, three, four, six and eight cylinders, ranging from fifty to twelve hundred horse power. Fine catalogs and plans of the line will be sent to those who are seriously interested in Diesel engines.

The Lockwood Twin for 1927

Probably the most outstanding of the 15 new improvements in the Lockwood Twin Boat Motor for 1927 is the Lockwood Pilot, a device best described as one which "takes hold of the motor when you let go." Unfortunately it is so small and so inconspicuous that an adequate illustration is impossible. Its purpose, which it perfectly accomplishes, is all-important. The motor is held gently but firmly in any position — straight ahead or on a circular course — that you may leave it. Yet it is entirely automatic in operation, and steering is accomplished with ease. The basic principles are simple, yet several claims of the basic patent application have already been allowed.

Possibly next in importance is the location of the stopping button in the end of the steering handle "under your thumb." No need to lose your course and bump the dock while searching for the button to cut off the spark.

There are also the improved magneto with replaceable moisture-resisting coil; larger muffler; the permanent mould castings 50% stronger; the larger and harder crank shaft; and the Water Guide added to the Stream Line to compel under water efficiency. All the previous features of the motor are retained, of course — the combination propeller and rudder steering without a rudder; automatic tilt over obstructions; patented safety propeller; float feed carburetor, etc.

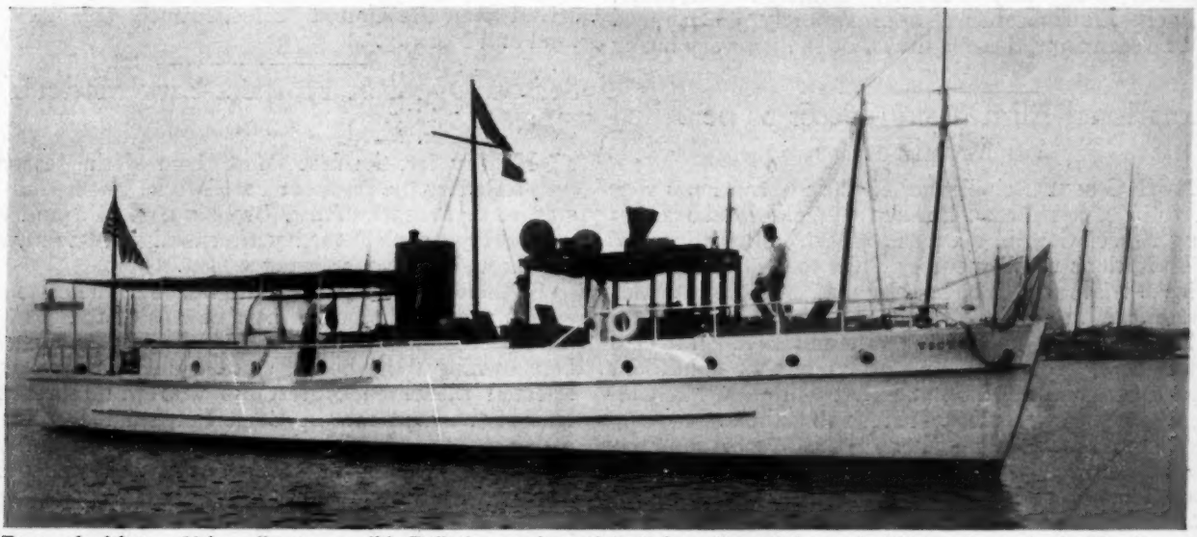
New Catalogs Received

We have received a copy of a new catalog from the Marine Compass Co., of Bryantville, Mass. The catalog is well illustrated and the prices quoted for this popular line of nautical instruments should be of interest to our readers.

The American Engineering Company have recently issued a booklet describing and announcing a complete new line of popular priced auxiliaries for yachts. The illustrations and text are very lucid. This company has been in business in the Marine field since 1857, and will be glad to send to YACHTING readers catalogs of their entire line.

Among the many innovations in yacht equipment shown in the E. J. Willis Co.'s new catalog is a combination outboard motor bumper, stern flag pole holder, and pole light.

Outboard motor boats are required to



Powered with two 50 h.p. direct reversible Bolinders engines, this 63-foot dispatch boat, the *Victor,* in service in Honduras, makes 10½ miles per hour.

A Good Turn!

Biscayne "Babies" are Valsparred!

SWISH . . . and they're gone in clouds of spray at 40 miles an hour, those *Biscayne Babies*. Yet they can hold the pace, for their powerful engines are placed in a rugged hull—whose good appearance is assured by Valspar, of course!

"Why take chances with some inferior finish," say their makers, the Purdy Boat Corporation of Port Washington, Long Island, "when we know and our customers know that Valspar stands the gaff? We use Valspar exclusively."

And they are *right*. Wherever you need a waterproof and weatherproof finish, be sure it's Valspar—for *one good turn deserves another!*

VALENTINE & COMPANY
456 Fourth Avenue, New York
Boston Chicago W. P. FULLER & CO., Pacific Coast

VALENTINE'S
VALSPAR
The Varnish That Won't Turn White

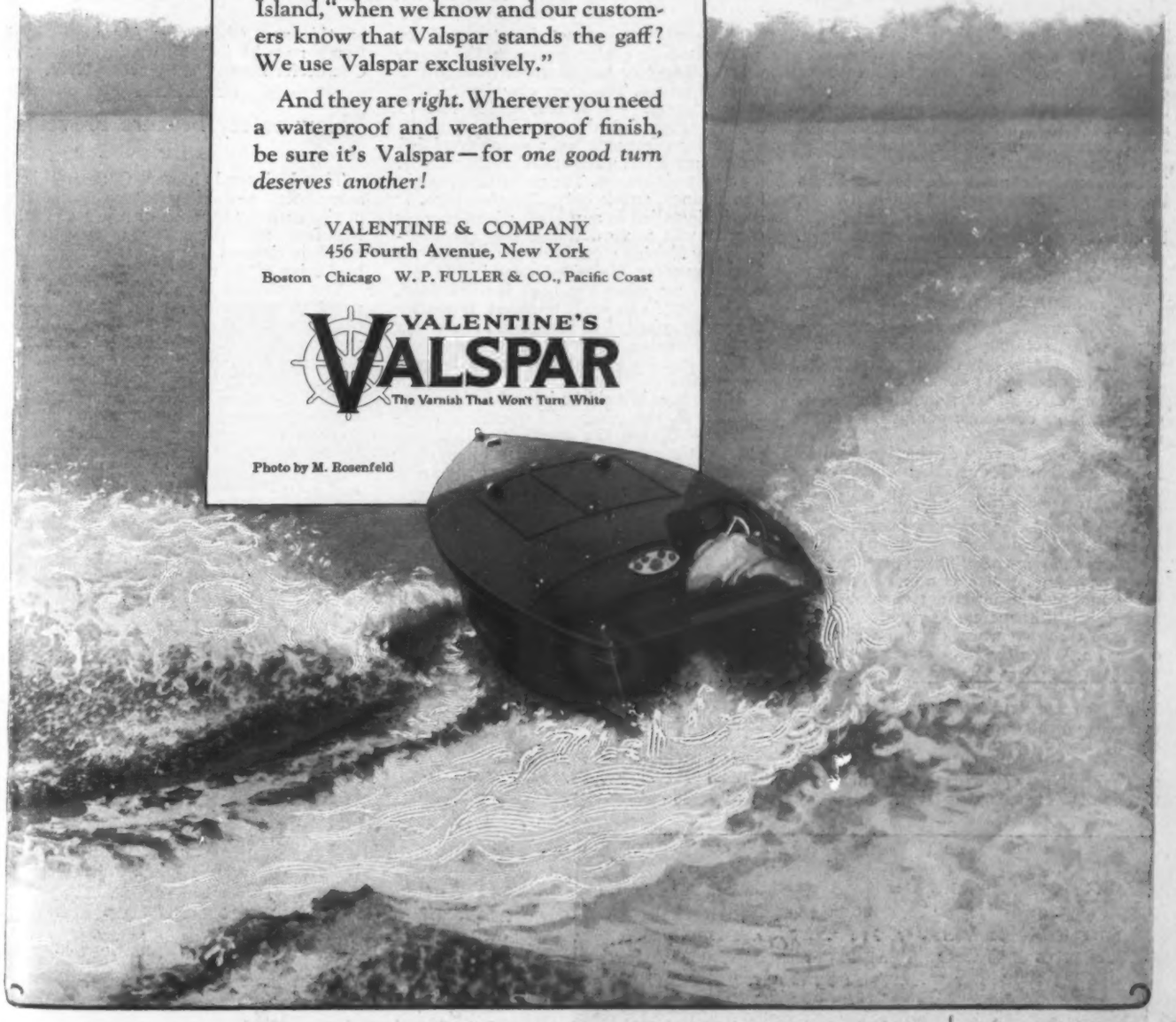
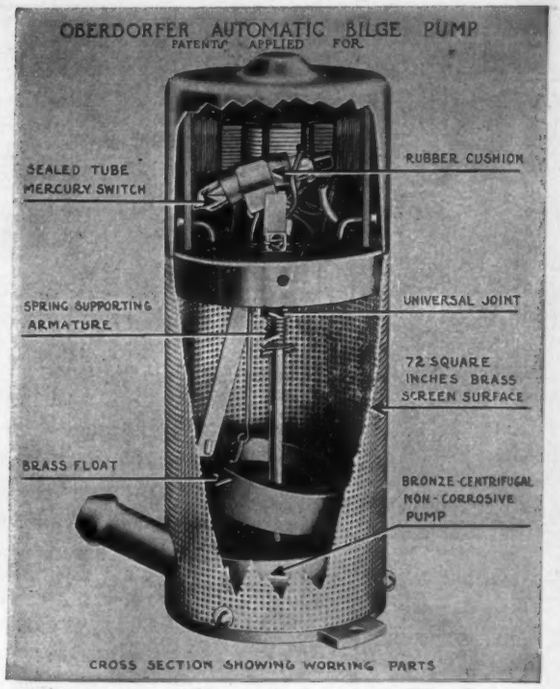


Photo by M. Rosenfeld

Gleam, a new fast cruising yawl built last year for C. V. Koslay, of New York, from designs by Ford, Payne and Sweisguth, and built by T. A. Kyle. She has a Scripps F-4 motor which has given excellent service under power.



Sectional view of Oberdorfer Automatic Bilge Pump.

have a stern light, they should have a flag pole, and for safety's sake, the motor should have a bumper. So all these features were combined into one piece. Wires from the pole light run through the hollow mahogany pole and bracket and are out of sight. A "Hot Shot" battery under the stern seat furnishes electricity for both bow and stern light. This bumper is made of heavy ¾-inch bronze pipe, measuring 1 inch O. D. Brackets and flag pole socket are of cast bronze. Bumper is removable when not in use.

A New Bilge Pump

The hidden mysteries of the new Oberdorfer Automatic Bilge Pump have been bared in a photograph showing a cut out view, just offered by the manufacturers, The M. L. Oberdorfer Brass Co., Syracuse, N. Y., for nearly 50 years one of the leading manufacturers of bronze pumps for marine use.

There are three very distinctive features in the mechanical operation of the new automatic pump. First is the non-corrosive brass float which rests inside the brass mesh walls. Second, is the mercury switch, sealed in a tube, and protected by a rubber cushion. Third, is the non-corrosive bronze centrifugal type pump, which is operated by the small motor contained in the same brass housing with the mercury switch.

These three elements control the entire operation. When the bilge water rises, as it flows through the screen, the brass float naturally comes to the surface of the bilge. When the brass float gets up high enough the rod which connects it with the switch throws the mercury tube, and the motor starts working, driving the centrifugal pump through the perpendicular shaft which runs through the center of the outfit.

The specially constructed motor, and the float switch, fit compactly inside the cover, which is fastened to the upper base with a series of screws. The lower chamber accepts water through the screen, which has 72 square inches of straining surface.

The pumping unit has a capacity of 350 gallons per hour, a remarkable achievement for a unit of this size. The pump weighs only four pounds, and is only 10 inches high. It can be installed in any boat, where there is 6 or 12 volt service. It operates automatically, by flipping a remotely situated switch for the purpose. If desired it can be put into constant use when the boat is to be used.

Very little current is required to operate the pump, as only 6 to 7 amperes are used per hour of running. With the large capacity it takes only a few minutes to pump out a good sized boat.

If the boat should be left with the pump turned off, the pump will operate successfully by flipping the constant switch even though the pump is entirely submerged in water. If this happens the motor should be dried out carefully afterwards.

This pump is low priced, and is being manufactured on a large production basis by this company, which is continuing its usual line of Oberdorfer circulating pumps and is developing its gear type pumps for further use in the marine field. Full details on this new Oberdorfer Automatic Bilge Pump may be had by writing the M. L. Oberdorfer Brass Co., Syracuse, N. Y.

New Safety Feature Prevents Fire

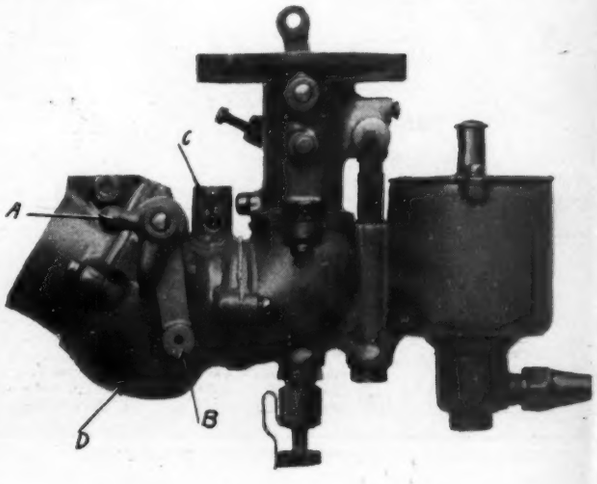
The Universal Motor Company have announced a new safety feature incorporated in the carburetors used on their Universal Flexifour and Superfour marine motors which is claimed to eliminate danger from backfiring of the motor.

The air intake is equipped with an automatic valve which closes in case the engine backfires or spits through the carburetor, thereby eliminating the danger of fire. The air intake is arranged so as to trap gasoline which ordinarily leaks through the ordinary carburetor when the engine is flooded by choking too much. The accompanying photograph illustrates the arrangement of the air intake part of the carburetor. Note that the weight A is attached to the choke valve and normally holds the choke valve open.

The choke valve may be closed by operating the choke which is attached to lever B, or the choke valve closes automatically by any back pressure through the carburetor caused by engine backfiring or spitting

(*Continued on page 108*)

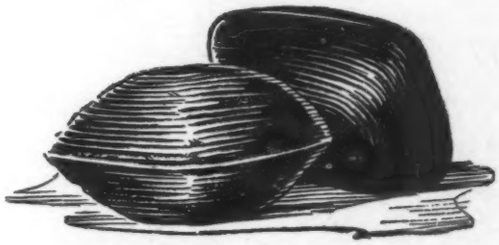
Right: New safety carburetor used on Universal motors.



Below: Speeds of over 25 m.p.h. are now possible with an outboard. *Sister Palm Beach*, with a Johnson motor.

The Finest Galley Fuel for Yachtsmen

Clean Burning— Hot Fire—Handy to Stow



Ford Charcoal Briquets are made from northern hardwood charcoal, ground and moulded into compact form. They give an intense heat and burn twice as long as lump charcoal.

There are no clinkers, no dust or fumes and practically no ash. Packed in handy sized bags, Ford Charcoal Briquets take up very little room.

Veteran yachtsmen everywhere recommend them as the ideal galley fuel. Try them in your galley stove. Any of the distributors listed below can supply you.

Produced by

Ford Motor Company
DETROIT, MICH.

Sold by

Baltimore, Md. - - Lyon Conklin Co.
Bay City, Mich. - Robert Gage Coal Co.
Boston, Mass. - Batchelder & Felton
Brooklyn, N. Y. - Chas Schaeffer & Sons
Buffalo, N. Y. - Chemical Charcoal Co.
Chicago, Ill. - - - - Berger Bros.
Cleveland, O. - - Goff Kirley Coal Co.
Detroit, Mich. - Viger's Coal & Wood Co.
Duluth, Minn. - Duluth Ice & Fuel Co.
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Morley Murphy Hardware Co.
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New Bedford, Mass. - Velvet Ice Cream Co.
Newburyport, Mass. - Cashman Bros. Co.
Perth Amboy, N. J. - C. M. Peterson & Co.
Philadelphia, Pa. - Thomas Bros. Inc.
Portland, Me. - Randall & McAllister
Providence, R. I. - National Coal Co.
Quebec, Que.
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Sandusky, O. - Geo. C. Matthes Coal Co.
Sheboygan, Wis. - C. Reiss Coal Co.
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ALDEN YACHTS FOR SALE

Number 280

A duplicate of this fine ketch, also a sister hull to Malabar VII. *Ready for immediate delivery.* Knockabout ketch rig. Faster to windward in rough water than any cruising or racing schooner of this size, a fact demonstrated on 1926 New York Yacht Club cruise. Very easily handled, as all sails are on travellers. Heavily and strongly built. High rail and roomy cockpit. 7½ tons outside ballast, 3 tons inside. 40 h.p. Scripps gives 7½ miles per hour and independent lighting plant in separate compartment aft. Has comfortable double stateroom, four berths in saloon, toilet and lobby amidships. Very large galley and two berths in forecastle. Can easily be maintained with one paid hand, although room for two. 54′ o.a. x 38′ w.l. x 12′ 6″ beam x 7′ 4″ draft. Also have sister ship with gaff schooner rig, Ratsey sails. *Boat completed and equipped in best manner.*

Full particulars from

JOHN G. ALDEN

148 STATE STREET BOSTON, MASS.

Number 307

I designed this handy little ship as an ideal single hander. I have cruised in her this spring and she can be handled by a boy under all conditions. The rig is small, the spars heavy. The boat is perfectly balanced under jib and mizzen or mainsail alone. It is surprisingly fast under sail. Has full 6′ headroom, full width double stateroom forward with toilet, large lockers, two side berths in main cabin, large galley aft full width of ship. Sink, coal stove, ice box. Coast Guard Kermath abaft mizzen mast gives speed of 7 miles. A husky little ship and hard to improve. 34′ o.a. x 9′ 10″ beam x 4′ 6″ draft, 6200 lbs. outside ballast, 3000 inside. *Three built only one left — ready for delivery.*

Number 227-B

A very fine ketch from my designs built 1925. 36′ 9″ o.a. x 28′ 4″ w.l. x 10′ beam x 5′ 9″ draft. Full headroom, and double stateroom forward. Good sized main cabin with galley and toilet. Ample locker space. A very able little boat in fine condition and excellent cruiser.

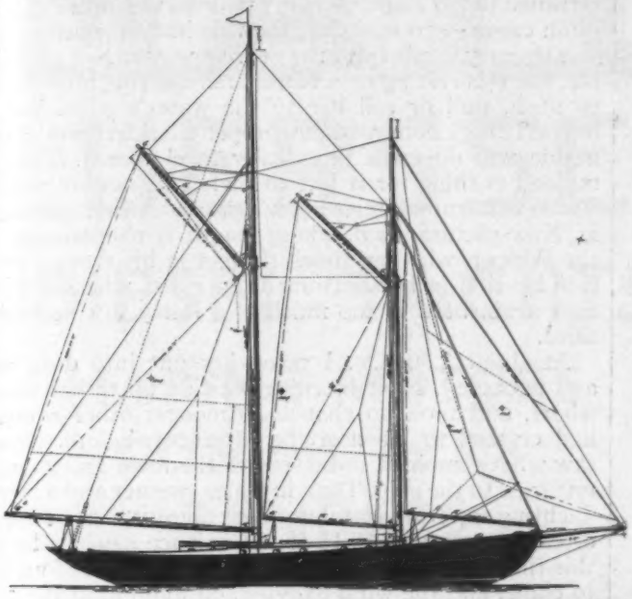
For information apply

JOHN G. ALDEN

NAVAL ARCHITECT
YACHT BROKER

148 STATE STREET BOSTON, MASS.

ALDEN YACHTS FOR SALE



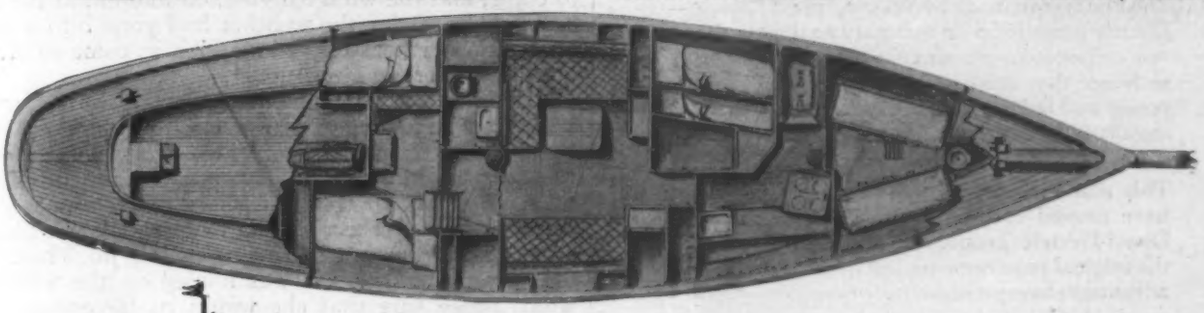
Number 306

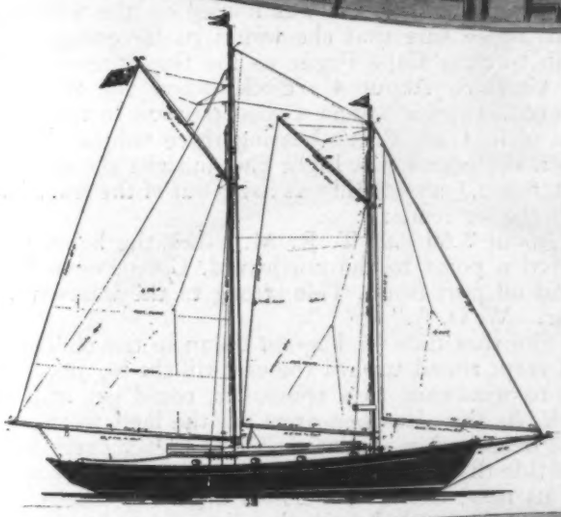
Probably the most roomy and able schooner of modern type yet designed. 58′ o.a. x 42′ 6″ w.l. x 14′ 3″ beam, 7′ 9″ draft. 4-cylinder engine, in separate engine room, gives speed of 7½ m.p.h. Remarkable accommodations consisting of two double staterooms and two transom berths in main cabin. Toilet amidships, very large galley and forecastle with berths for two or three paid hands. Has high bulwarks and is of heavy construction but will sail very well. I designed her as an improvement of the successful Trade Wind and I can recommend her as a very able and fast cruiser capable of going anywhere in comfort. The exterior finish is in teak with white pine decks. Interior mahogany and white panelled. *Immediate delivery can be made.* Equipment is most complete and includes independent lighting plant and cedar boat.

Plans and details on request from

JOHN G. ALDEN

148 STATE STREET BOSTON, MASS.





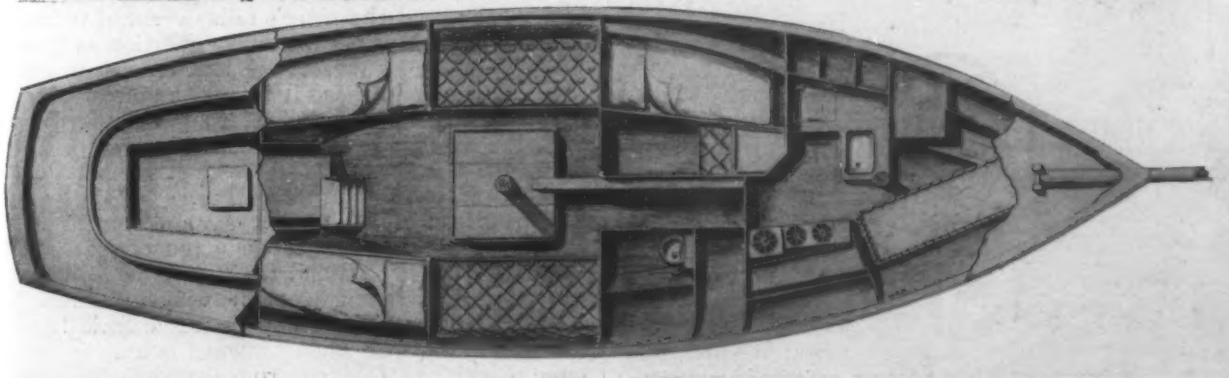
Number 309

Very Able Combination Keel and Centerboard Auxiliary Schooner, either gaff or marconi mainsail, 43′ o.a. x 33′ w.l. x 12′ 6″ beam x 4′ 2″ draft; 8200 pounds of outside ballast. This boat works well to windward without using small centerboard; probably more able and as fast as similar sized keel schooner; very large saloon, with four wide berths, comfortable single stateroom, toilet and large galley; roomy forecastle for one man; strongly built of best materials; four-cylinder Scripps gives eight miles under power; extremely good looking; very completely equipped.

Plans and details by writing to

JOHN G. ALDEN

148 STATE STREET BOSTON, MASS.



Why

Yachtsmen are turning to Westinghouse *Diesel-Electric Drive*

THE increasing interest in off-shore cruising and the resulting demand for a wider cruising radius and more economy of space, forced designers and builders to seek a super type of propulsion that would meet these requirements.

The fine record made by Westinghouse Diesel-Electric propulsion on Submarines during the war convinced a prominent yachtsman and his architect that this would be the ideal yacht power and led to the first Diesel-Electric yacht installation in 1920.

This and the many succeeding installations have proved conclusively that Westinghouse Diesel-Electric propulsion not only has met the original requirements, but in addition these advantages have provided *full control centralized on the bridge; power available under all conditions; a better distribution of machinery; reduced engine room crews; smaller crew quarters; and more luxurious comfort.*

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Sales Offices in All Principal American Cities
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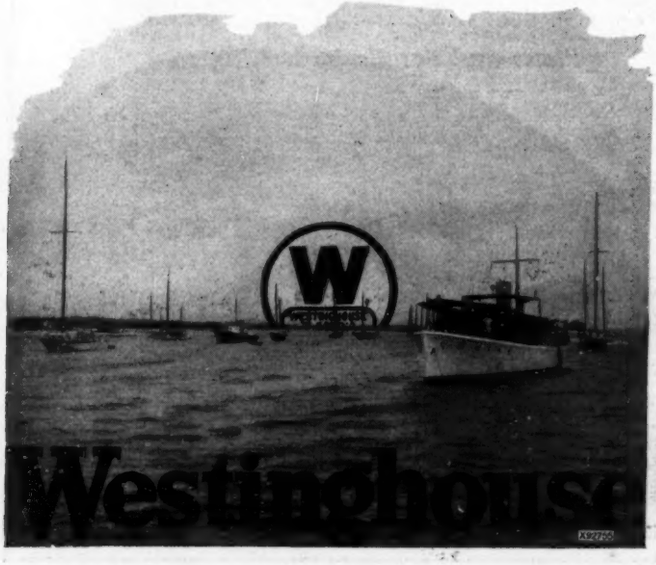

Southeast for Nantucket

(*Continued from page 58*)

returned to the *Vagrant*, ready to cross to Coitu Point and pitch camp — to find that the tide had dropped and she was seventy yards from the nearest water. Not only that, but she was resting on a salt marsh too rough to allow us to push, pull or roll her to the water's edge. We had hurried off at noon without proper consideration of what a tide will do on a practically level marsh. There remained nothing for it but to make the best of matters. Those who know dories know how much floor space there is. Now picture Tom, whose length is phenomenal, and the skipper, who can touch six feet in his shoes, sleeping side by side in her bottom; then guess whether I have ever again been in too much of a hurry to calculate the tides.

At about 2.30 A.M. I poled her out into deep water and anchored. Next morning we tied up to the steamer wharf, and took no chances. Amongst other things we had crossed to 'Sconset the afternoon before. Now we saw what remained to be seen of the town and about ten returned to the ship. Tom, in white sweater and a German yachting cap from Hamburg, lent dignity to the ceremony of casting off, and 10.15 found us once more under way, this time for Woods Hole, with a head tide for four hours to come, and the wind hanging, off and on, in the northeast quadrant, for the weather had gone into a spell of fair warm northeasterly winds such as come so often for a week or more in late August.

That was the longest single passage the *Vagrant* has ever made. Holding a course close in shore to get the back water from the east tide — for the tide sweeps north in the Muskeget Channel when east in the sound, giving a northeast trend off shore and a westerly backwater close in — she was able to carry the wind well aft, and make better time by setting the big jib. Then, off the Muskeget Channel, she was hauled on the wind somewhat, to be sure that she would be far enough to the north to clear Cape Pogue as the tide turned south in the Channel. About 4 o'clock, when the tide finally changed, *Vagrant* was in a good position to take advantage of it, Cape Pogue bearing three points on the lee bow and Hedge Fence Light Ship in sight ahead. Beyond that, again, Quisset Hill was rising out of the sea. An hour later the log reads:

"About 5.00 P.M. T. R. M. takes the helm. Course altered a point to the northward. Cape Pogue bearing broad off port beam. Tide strong to the westward. Sky clear. W. O. A."

From that time on *Vagrant* began to travel. The wind had crept round toward the east till the big jib, boomed out to windward as a spinnaker, could get in its best work. As the afternoon drew on, the land to the northwest deepened in shadow and rose higher every minute. The tide that had kept us back in the morning was pushing us now, and as the colors began to change in the western sky, and the mare's tails overhead to turn from lavender to pink, it began to be a question as to whether or not the wind would serve us long enough to get in. As Nobska loomed up ahead it became a matter of minutes. Every puff of air was lighter than the preceding one, while the west tide swept us along like a chip. Two days before the wind had been more than we could use; now it was rapidly failing us altogether.

As the last breath died away and left us reflected, illumined by the sunset, upon a sea of glass, within a stone's throw of the Coffin Rock Buoy by Little Harbor, scarcely a quarter mile from the wharf, a familiar sound reached our ears. There was the same little lobsterman that had passed us when outward bound, in much the same place! The *Job*, free from troubles, chugged along-

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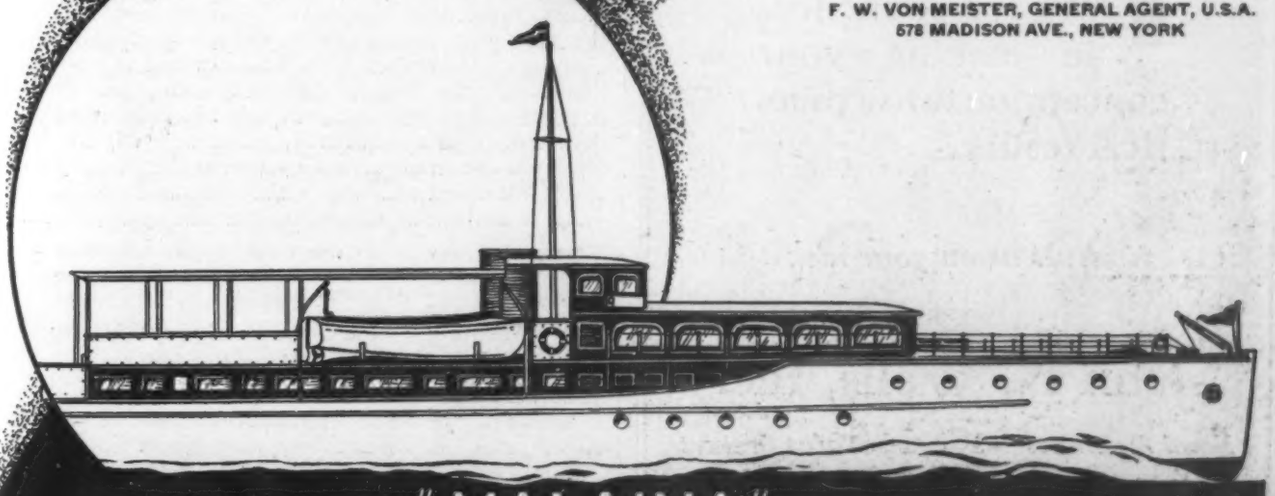

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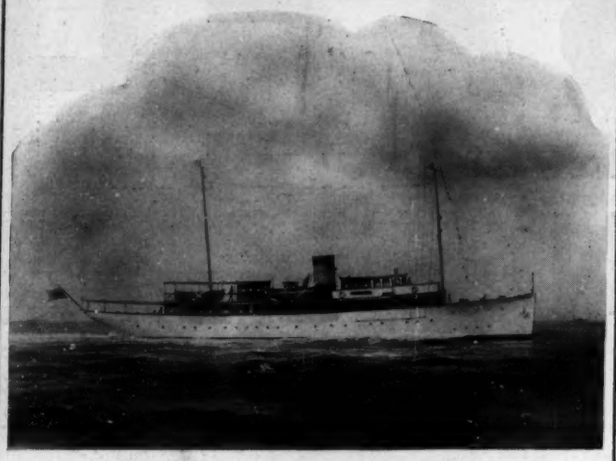

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Consult us on your ideas

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side, passed us a line, and fifteen minutes later we were fast again to the M. B. L. wharf.

Here the real cruise ended, for my shipmate took his gear ashore, and next morning, having spent the night with him, I set sail alone for the home port. The wind and tide served me to such effect that at a little before noon the *Vagrant* entered the shallow channel of Waquoit Bay and two miles beyond picked up her mooring. Here I, too, took my gear ashore. So ended another voyage.

Thus, in conclusion, I repeat what at the outset I maintained. Though the comfort of a full headroom cabin has much to recommend it — as I know from many such cruises — nevertheless, there is a unique pleasure derived only from the little boats, and had those of my readers whose eyebrows lifted at the opening paragraph of this yarn been with me aboard the *Vagrant*, I think that they, too, would have come home converted.

Spotting the North Star

(*Continued from page 63*)

This computed altitude of the star (38° 08′) is set on the sextant and about $21^h\ 56^m$ (G. C. T.) the reflected star will be found in the field of the telescope if sighted toward the horizon in the direction true north as indicated by the pelorus.

At first glance the navigator may balk at using this method for "spotting" the star because of the comparatively lengthy computation for determining this approximate altitude. It is not necessary, however, to perform this work each day of the voyage. In the back of the navigator's record book note can be made of this altitude of the star and of the latitude of the vessel for the first day at sea; for the altitude on the following day the difference between the dead reckoning latitude of the vessel for the time of observation and the latitude for the previous day is applied to the altitude of the star for the previous day. This record can be kept in tabular form as follows, and the procedure repeated from day to day:

SPOTTING POLARIS
P. M. Observations

Date	*D. R. Lat.*	*Approx. Alt.*
December 25	37° 15′ N	38° 08′
December 26	37° 55′ N	38° 48′

At twilight the first day at sea, December 25th, the vessel's latitude by dead reckoning had been 37° 15′ N, and the approximate altitude of Polaris for that latitude and time had been computed to be 38° 08′; for the second evening the dead reckoning latitude was reckoned beforehand to be 37° 55′, an increase of 40′ in latitude since the previous evening. To the altitude (38° 08′) for the evening of December 25th is added 40′ and the result (38° 48′) is the approximate altitude of Polaris at twilight for the evening of December 26th. This altitude is now used for "spotting" the star the second evening, and the values entered in the table for future use. It will be of advantage, of course, to substitute in the table each day for the next day's use the *actual* values, as soon as they become known, of the observed altitude of the star, and also the actual value of latitude in place of the latitude by dead reckoning.

[In view of the increased interest in navigation by yachtsmen due to the ocean races of the last few years, this article on a simple and accurate method of obtaining the latitude is most timely. — ED.]

Yachting on the Other Side of the Atlantic

(*Continued from page 68*)

yacht, it will be seen what really comfortable living quarters can be had on an International "Twelve." The saloon is 11 feet 9 inches long on the port side, and 7 feet 9 inches long on the starboard side — there being a sofa-bed on the port side with a sideboard at the head and at the foot — and the headroom in the saloon is a little over 6 feet. On the starboard side, just abreast of the mast, is the lavatory, and on the port side, the pantry. The

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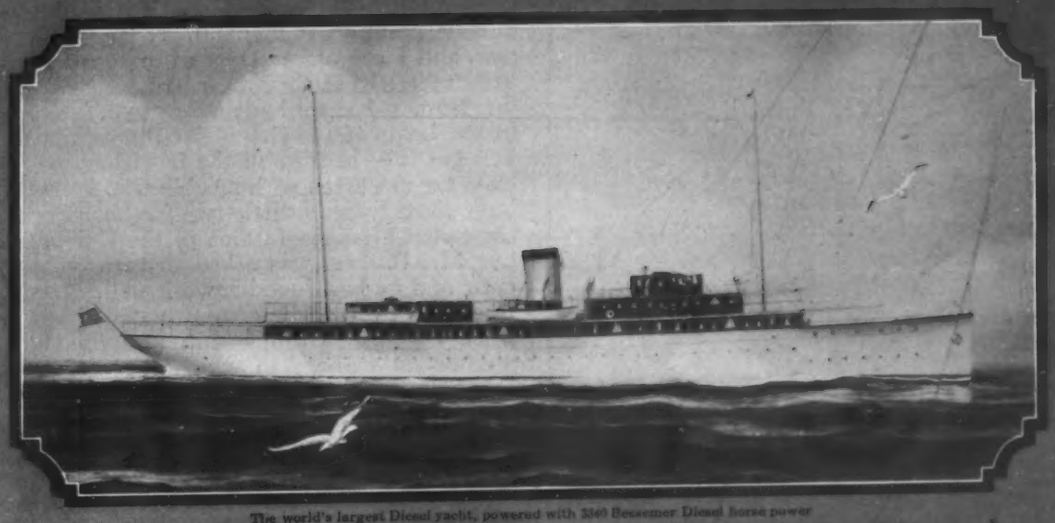

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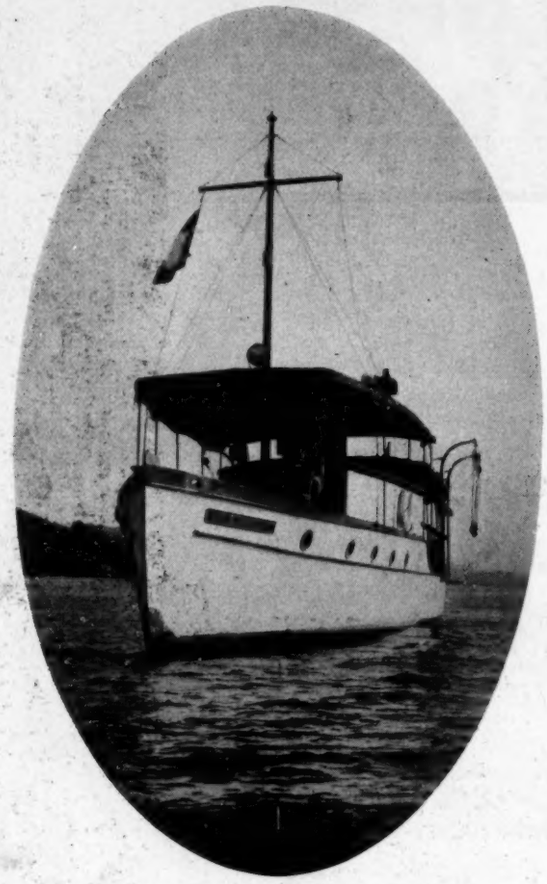

HAVING featured the BOLINDER auxiliary type of cruiser in the February and April numbers of YACHTING, the picture shown in this issue is typical of the BOLINDER full-powered cruiser. This is the *Messenger*, a twin-screw craft, 62′ x 11′ 6″ x 3′ 6″ draft, in service at Iloilo, Philippine Islands. With two 30 h.p. 2-cylinder direct reversible BOLINDER Oil Engines, the *Messenger* attains a speed of 9 miles per hour. A more economical, dependable and serviceable power plant would be hard to find — and there are no fire hazards with a BOLINDER.

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owner's cabin, about 6 feet 4 inches in length, is on the starboard side abaft the saloon, and there is a compartment for baggage on the opposite side of the companionway. The double-berthed after stateroom, or ladies' cabin, is also about 6 feet 4 inches in length and has ample floor space.

The Editor has asked me to write only about yachting in British waters, but I feel sure he will allow me to tell you something about the new ten-meter one-design boats for Long Island Sound which are now nearing completion in Germany. A short time ago I had the pleasure of visiting Messrs. Abeking & Rasmussen's yard near Bremen. When I went to Germany I had no idea what a treat there was in store for me. It is not every day that one has the opportunity of seeing 14 one-design racing craft in various stages of construction, from the time of the laying of the deck beams and covering board, to that when the interior accommodation is completed and the outside painting is in hand. That, however, is what I saw, and I can assure the fortunate owners of these fine little vessels that they are getting a good job. Mr. Starling Burgess has not had an easy task to get the headroom in the boats of the size of an International "Ten," but he's got it — in spite of the fact that the yachts in this class are not fitted with a cabin top. Personally, I should have liked to see a little less freeboard and a cabin top somewhat after the fashion of the Universal Rule boats, but Mr. Burgess was asked to turn out a flush decked craft and he has done his work well. Messrs. Abeking & Rasmussen are to be congratulated, both on the excellence of their workmanship and on the careful and methodical manner in which they have selected their materials.

On my return to England I was called upon to survey and measure the four National Class 14-foot dinghies which Morgan Giles has built for Long Island Sound racing. These boats, which have been built to the order of Messrs. Paul Hammond, Donald H. Cowl, J. Linton Rigg and O. H. Perry, will, I think, make a very favorable impression on the Sound. Beautifully built of 5/16-inch selected mahogany, they weigh — with rudder and centerboard gear, spars, rigging and sails — about 290 pounds, and their polished bronze center plates weigh about 135 pounds. They are 14 feet over all, with 4 feet 9 inch beam and have a bold flare forward and an equally bold tumblehome to the transom. Their sail area is only 125 square feet, but this is found ample for sea work. The type has taken some 30 years to evolve and we, on this side, believe that it represents the most perfect example of small racing craft that it is possible to produce.

Those Fishermen

(*Continued from page 55*)

minutes. About 12 miles of this was to windward, in long and short legs. Excellent time for any yacht, and seldom matched on regatta courses; but not unsurpassed.

If I am not mistaken the fastest America's Cup time ever made was by the first *Columbia* — the schooner — in 1871, 3 hours and 1 minute for a course 20 miles to windward and back. I was not there to see it, but it must surely have been "all down hill," what was intended for windward work proving one reach and the run to leeward another. *Vigilant* did 15 miles to windward and back in the race against *Valkyrie II* in 1893 in 3 hours and 24 minutes, a few seconds better than her best time on a 30 mile triangular course. That is not as good, in proportion, as *Bluenose's* best time for 40 miles on a five-sided course, a triangle with a tail.

These schooners are grand reachers, as they should be, with a racing waterline of 112 or 114 feet, and 10,000 feet of canvas. I am not aware that *Bluenose's* best time has ever been excelled by *Resolute* or *Vanitie*. That was 6.3

A New

Diesel Auxiliary Brigantine

Below is shown an illustration of a Gielow designed Diesel Auxiliary Brigantine, now being built, and which will be sailing the high seas by January next. This craft is of steel construction, 147′ 6″ in length and a beam of 30′. It will have 10,000 square feet of sail area and a 300 h.p. Diesel auxiliary engine.

An unusual feature of this boat is that, by merely dropping the cross-sails, it becomes a normal schooner and will readily sail to windward.

Several yachts, larger than any now afloat, have been designed by and are being built under the supervision of this organization. Experienced yachtsmen have learned that in a Gielow designed boat they can obtain greater satisfaction and more real value per dollar expended than they have been able to secure anywhere — either here or abroad.

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nautical miles in 29 minutes, on October 22, 1921 — just over 13 knots. Of course every crew of every flyer will cite instances where she "must have been doing" better than 13, and they may be right, but we are sticking to stopwatches and measured courses.

In windward work the time made in most fishermen's races would be excelled by yachts of much shorter waterline. America Cup contenders have worked ten miles dead to windward in 60 minutes. A fisherman would take two hours. Their sails are not cut as well to begin with, they get a lot of hard usage, and they cannot be made to stand like yacht sails for windward work.

To talk intelligently of fishermen's sails the yachtsman has to unlearn one language and learn another. The maintopmast staysail in a fisherman is "the staysail" — just that and nothing more. Some of us are prone to think of the staysail as the sail which Englishmen call a foresail in a cutter, and we call the forestaysail. Fishermen sometimes call that the stem-staysail, but more often the jumbo. What we call a jibtopsail is sometimes called the outer jib by fishermen, but more often the balloon. There is no true balloon canvas employed in these schooners, and no spinnaker. They are, very wisely, raced under plain working canvas, strong heavy stuff that will stay in the boltropes until the spars go over the side. It is on this that men's lives hang when their splendid schooners have to claw off the Sable Island lee shore in the teeth of spring hurricanes.

These staysails are huge areas of canvas, always foursided, always set flying, and it is impossible to keep a hard luff on them in a breeze. It is a point of honor with fishing skippers to hang on to them until they "take themselves in" by blowing to ribbons or tearing out a topmast. They have a marked heeling tendency, but that they pull ahead at all at times may well be doubted.

Sail dragging is one virtue the racing fisherman does possess. As the schooners make their really creditable record for speed off the wind, perhaps sail-carrying is of more value than we think.

I shall never forget the scene in the *Henry Ford*, the last international race off Gloucester, with the lee deck so far under the ocean that the upper deadeyes of the main shrouds were buried, and the second set of ratlines wet. That means that her coveringboard was nine feet under the surface, and the water was twelve feet up the deck, swashing around the hatch coamings. The afterguard stood upright on the weather side of the house, our shoulders resting against the monkey-rail of the weather bulwarks. The lee alleyway, on the opposite side of the house, was filled to the level of the cabin top with a seething torrent of brine that spilled over the taffrail. The fore topmast had gone out of her some time previous, the head of it wrung off by the tug of the ballooner. And was the gang nervous? Just this much. They were hanging with their elbows hooked over the weather rail, and shouting as one man:

"Attaboy, Henry, old hound!"

"Watch 'er take the next one!"

"Drive 'er, Al! Sock it to 'er, Al! That's a good one, Al! Give 'er another!"

"Al" was Captain Al. Malloch, grinding away at the wheel, with the grating afloat under him. He was "spelling" Captain Morrissey — staunch old Clayton, his face contorted with pain, doubling his great length over the brass-capped mainsheet-bitts to get his unruly "innards" back into shape. Poor chap, he was due, or overdue, at the hospital then. But he grimly went through with the race series; and between gasps he would add his voice to the chorus of the wild Indians hanging on to the weather rail:

"Drive 'er, Al! Sock it to 'er! Give 'er another!"

Magnificent, but not a paying proposition, this particular saildragging. It took us 23 minutes and 49 seconds to

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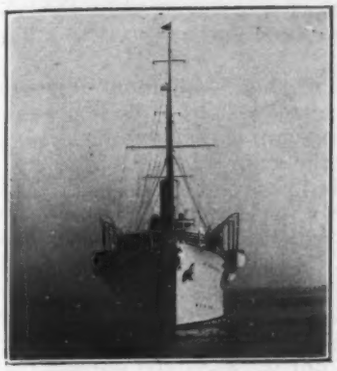

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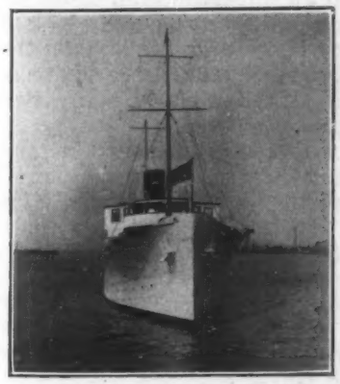

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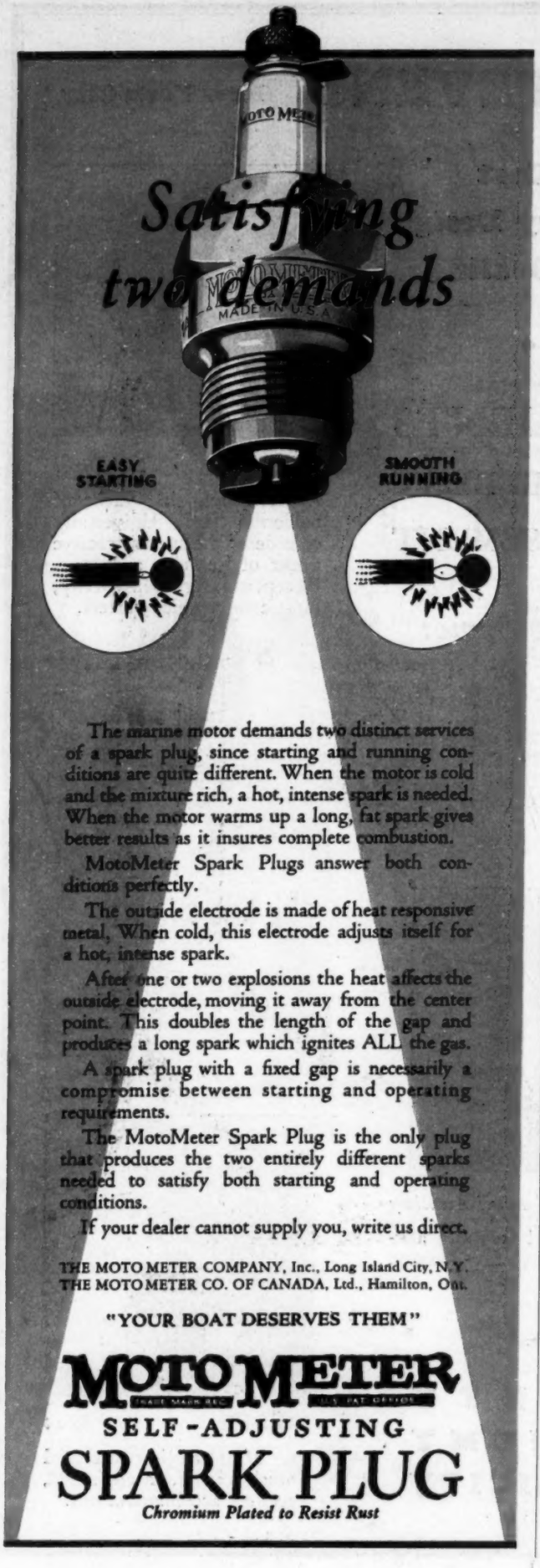
One of our earliest successful Diesel yachts, high speed, excellent accommodations.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The outside electrode is made of heat responsive metal. When cold, this electrode adjusts itself for a hot, intense spark.
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do the five miles of that leg — a close reach, with the lee deck sunk as deep as the Southern Cross all the time. Not quite a 12½-knot clip. The *Ford* should have done better than that. Yet the *Bluenose*, not buried nearly so much, only bettered the time by 25 seconds.

In one particular the fishermen put it all over yachtsmen, and that is in getting sail off. On board *Haligonian* one brisk day off Halifax, I was staggered by the celerity with which she was shortened and stripped to a harbor-furl.

Captain Moyle Crouse, her skipper, a quiet-spoken giant and very capable seaman, said: "I do believe there's the tug. Clew up that fore gaff topsail and let the balloon run down! — Yes, it is the tug. — Let her come up. Run down your jib and jumbo! Fore throat and peak halliards! Let the foresail run down. — Lay aft, some fellows, now, and get the mainsail on the boom while she's still head to wind!"

Five minutes by the watch from the first word, and in that time the *Haligonian* was completely stripped of sail and her canvas well on the way to the sail covers.

Now who of us has not watched the endless dodging back and forth, jibing, wearing, staying, hanging in the wind, boxhauling and general running wild of a fleet of yachts at the end of a day's race? I recall one 30-mile cruising race last summer which took us four hours to sail — and another hour to get sail off! Probably you can do the same. Of course, yachtsmen specialize on quick canvas-handling while the race is on, and they feel that they can take their time when the race is over. And, yacht sails being worth their weight in silver, they have to be taken in carefully and bagged and tagged and kissed goodnight and tucked away in their proper cots. Against this is the lifelong training of the fishermen. It may take "all day and part of the night" to get sail on a vessel, but when the Old Man says to get it off it's got to come off as the words leave his mouth. For they all make a point of hanging on to what they have to the last possible moment, and maybe past it.

If you value your life there are three other things besides your yachting cap you had better leave behind — at least if you are going to race in a "bluenoser." The only Gloucestermen it has been my privilege to race in have been the *Henry Ford* and the *Columbia*, and in these vessels I have not heard the objection raised. But if you are going to race in a Lunenberger there are three things you must *not* bring aboard:

1. A yellow sou'wester.
2. A pair of grey mitts.
3. The word "pig."

Any one of them, and all three, are fatal to the luck of the day, the trip, or the whole season. Have a look at the fisherman's crew, as they bustle about pulling off the sail covers in the black gloom of an October race day morning. What do you see first of all? Their hands. Why? Because they are wearing white canvas gloves.

They may vary this with striped ones of blue and canary, or gauntlets of tanned leather. The fisherman is only horny-handed in fiction. In practise he is wisely careful of his hands, for a sore finger on the Banks may mean an empty dory. But as for grey mitts — overboard with them. Better freeze or blister or get blood poisoning for lack of fist covering than damn the vessel's luck with the fatal grey.

And the same with sou'westers. Better be drowned bareheaded than wear a yellow one.

Angus Walters, master of the *Bluenose*, is a level-headed and enlightened business man, at the top of his profession, and handling a property investment of $35,000 to the eminent satisfaction of thirty-odd drawers of dividends. But I have heard him "bawl out" a man of captain's rank till his ears were redder than the port sailing light, because the offender used the word "pig-headed."

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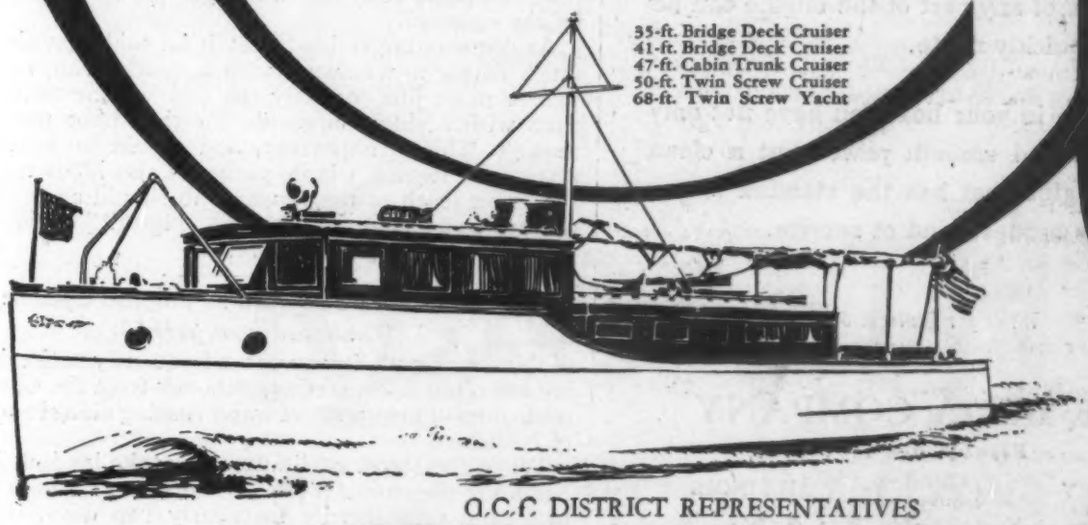

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LAKEWOOD, OHIO—M. J. Shea, 1424 Lauderdale Avenue
MIAMI, FLORIDA—C. T. Chenevert, 615 First National Bank Building
SAN FRANCISCO, CALIFORNIA—S. C. Kyle, 417 Rialto Building
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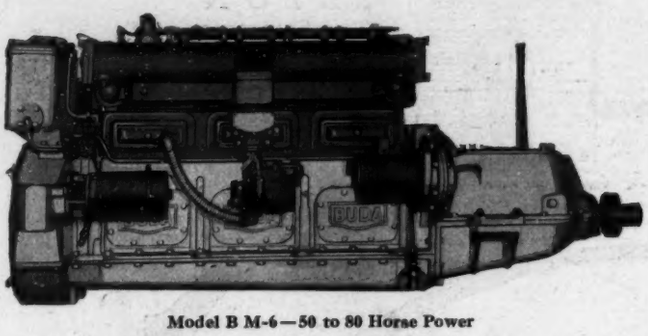

Model B M-6—50 to 80 Horse Power

Unusual Simplicity and Accessibility in Design

The extreme simplicity of Buda design, the employment of only tried and proven engineering principles, and the complete absence of freakish ideas and experiments are winning more and more boat builders to standardize on Buda power. Owners, too, recognize these Buda features and are re-powering their boats with Buda marine engines, because simplicity means greater practicability and longer service.

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Write for Bulletin 580

THE BUDA COMPANY

Established 1881

HARVEY (Chicago Suburb) ILLINOIS

BUDA POWER

The Aerodynamics of Sails

(*Continued from page 62*)

a lee helm; this shows how much the driving force in the mainsail has been weakened, the reason for this being the disturbance of the "pig-tail" eddies.

VI. The distance between the tack of the jib and the mast should be as short as possible, that is, the jib should not be set too far forward — not more than a third of the length of the boom. At greater distances the position of the jib when trimmed is too close — the angle of opposition too small with the effect that the wind off the jib does not flow parallel to the mainsail, but falls onto it. Furthermore, the shorter the distance between the tack of the jib and the mast, so much more erect will the jib — its fore leech — stand; and the more erect the jib, so much the more will the drive of the jib be directed horizontally and not upward. See Diagram V.

If the distance between the tack of the jib and the mast is no more than one-third the length of the boom, one may trim the jib closer, and by thus narrowing the slit the air current will be accelerated and the funnel effect increased. See Diagram V, G.

To summarize: the chord of the arch of the jib (diagram VI) should not run parallel to the boom, as the arched after-leech of the jib would then throw its wind onto the mainsail, but should form an angle of at least 10° to 15° with it, as indicated by the prolongation of the boom in line G. The jib sheet cleat, *i.e.*, the deck eye for the jib sheet, should lie in the prolongation of the chord of the arch of the jib — on the line S. If the eye is on the deck, the jib should not, therefore, extend any farther aft than the point marked v_1 in the drawing; but if one can put the deck eye farther out, as is possible with a broader boat or by means of an outrigger, a considerably larger jib may be carried (see v_2 in drawing). The farthest point aft to which the jib should be extended, would be determined by the intersection of the chord of the arch of the jib in its prolongation (the line S) and of the direction of the apparent wind (the line W) of the drawing; this, however, on the assumption that the lines of flow in the lee of the mainsail did not deviate from the direction of the apparent wind W. On this assumption a broader jib — the portion extending farther aft than the point K of the drawing — would be blanketed by the mainsail.

As respects larger boats, let it be said that they sail much better to windward with a divided sail, *i.e.*, with two or more jibs correctly cut and set one to another, than with a single large jib, for the above mentioned reasons. This is important, and should be taken into account in rigging a large yacht. It also holds true that the lower leech of the forward jib should slope sharply upward so as not to disturb the "pig-tail" eddies of the sail next behind. (*To be continued*)

Grim Forces Chartered in Tropical Cyclone

(*Continued from page 50*)

of this storm swell, its waves are frequently noticeable but are not often disconcerting, although from the China Sea come tales of huge walls of water rushing along in advance of typhoons.

When the storm swell approaches the land, as it does heralding the storm, it piles up on shore, raising the normal tides substantially for nearly two days, in many cases, ahead of the storm. As the cyclone draws near this piling up of the tides becomes marked, and when it is bearing down on the coast that is the time to look for the often referred to "tidal wave." These "tidal" or "storm" waves smash over breakwaters, batter craft of all sizes and even hurl large vessels for long distances upon the shore. The storm tides of the right of the storm's advance are truly awful agencies of destruction and death.

Yale Selects Kermath *for* Its Coaching Launch

"Stro-o-oke!" Arms and legs are working in perfect unison—backs bend with clock-like regularity. "Drive 'em down!" The spidery shapes of the eight-oared shells gather added impetus. Another Varsity crew has been turned out by Coach Leader. All through the year no detail has escaped his wary eye. Even the new coaching launch built by the Portland Yachtyards was carefully laid out to afford minimum wake at racing speeds, large enough to carry extra rowing equipment and nine extra men, fast enough to travel 25 miles per hour or run at an idling speed of eight to ten miles an hour for long periods. A Kermath 100 H.P. six-cylinder motor was selected not only for its outstanding power delivery, but for its perfect carburetion at all speeds.

Both of Yale's coaching launches are now Kermath equipped—a great tribute to a fine motor.

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Electricity for your Boat

"the greatest convenience on the boat"—

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Homelite
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32 or 110 volts — 600 watts

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Booklet Y6

HOMELITE CORPORATION
Port Chester, N. Y.

The recurving winds of the left front quadrant, and the compensation of the water medium carrying the storm waves, cause a natural resultant outward flowing tide at those points in front of and to the left of the center of the storm's advance. Hence, it will be seen that the tide rises, over and above the normal, well in front of the hurricane advance, but on the cyclone's right half advancing front; and, that the tides fall abnormally in front of the storm's left half.

The isobars are pretty well distributed circularly around the storm center, out to 29.40, with the steepest gradient generally in the right front sector. Should the storm curve to the right in its progress the gradient would then be steepest in its front; or, in the rear if the curve should take place to the left.

From this new knowledge of tropical cyclones a pretty good set of "hurricane rules" can be laid down for yachtsmen. The beginning of such a hornbook appendix might well follow in this wise:

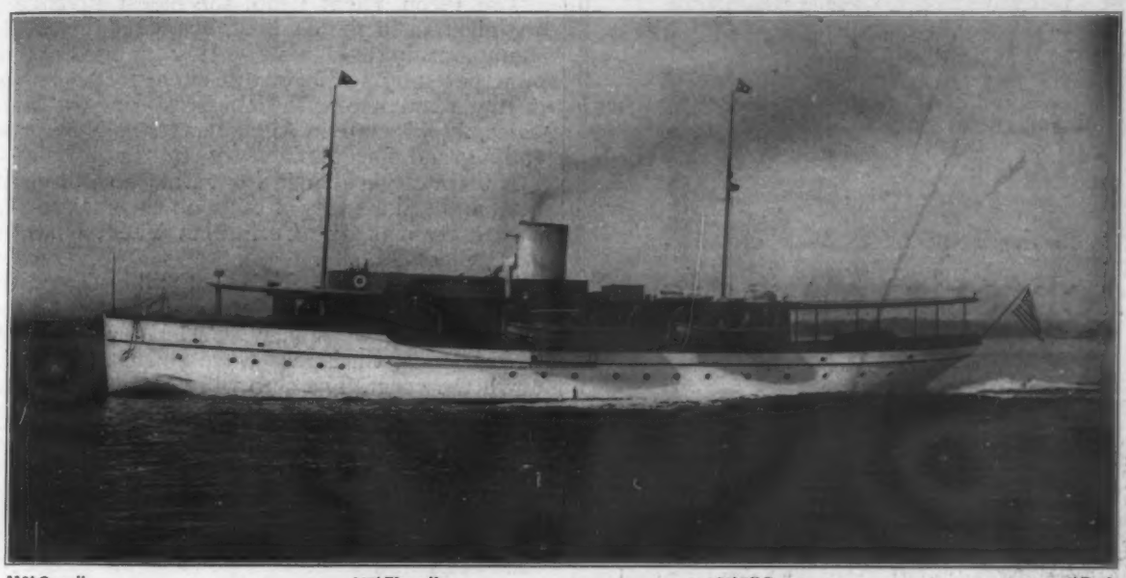
When the Weather Bureau reports the approach of a tropical disturbance in a direction toward one's anchorage, it is well to watch the tides. If the tides begin to pile up a bit when the storm is 250 to 350 miles off shore (at a rate of 10 miles per hour for its advance) one may well look alive until the abnormality in the tide action is clearly defined. If the piling up becomes pronounced within a few hours, one may well prepare for a "tidal wave." It will probably strike with great force. Expect and prepare for high water, torrential rains and fierce hurricane winds, is a sound injunction.

If, on the other hand, the tides run out extraordinarily, a close watch having established this, one may consider danger from a "tidal wave" likely only if a change in the storm's direction takes place. In that case such a change is almost always discernible from the normal warnings. In the cases where the tides are persistently reduced, one may expect in that sector less fierce winds, little rain and more than an even break to weather the storm.

The yachtsman at sea, warned by radio of a hurricane path, should at once roughly chart the reported path of the storm, project its probable advance in line with the prevailing winds and then lay his course accordingly to evade the full force of the right half winds. If his position should be well in advance of the charted storm's right front (not his own starboard or port) he should seek to make beyond the cyclone's extreme right limit as it advances. The known cyclonic areas indicate that rarely do hurricanes extend beyond a 200 mile radius from the storm center. However, unless his chances for this are better than fair, he may run into trouble by being overtaken by the gusty hurricane winds of the right front quadrant. These would give him almost irresistible head winds, battering seas and — disaster.

If his position should be near the probable path of the storm center, he should beat his way toward the cyclone's left front in order to place himself, on its approach, in the less violent, and more often favorable off shore winds of the left front and left rear quadrants. From these the average sea boat can hold a course out of the storm area.

An easy way to chart a storm is to mark the reported path on a chart and project this along the course of the prevailing winds; through the last reported center of the storm a "400-mile" line coincident with the cyclone's path will mark the longitudinal diameter dividing the tumultuous right half from the left half of the storm; through the cyclonic center, at right angles to the longitudinal diameter, another line of equal length will complete the quadrantal division. The cyclone's advance determines its front, and its right and left are the right and left of a landsman's road guide.



110′ Overall 103′ Water line 20′ 6″ Beam 6′ Draft

DIESEL YACHT NEVADA

Designed and built under our supervision for De Ver H. Warner, Esq., by Henry B. Nevins, Inc.
Powered with two 6-cylinder, 150 H. P. Standard Diesel Engines. Speed — 15 miles

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"We have used Jeffery's Marine Glues with uniform success for many years and always recommend it. Our principal use of this Marine Glue is for deck seams, but we have also found it excellent in bilges, filling up space between keelson and the garboards, thus eliminating water pockets and increasing the life of the boat."

FORD, PAYNE, *and* SWEISGUTH
(*Signed*) GERALD W. FORD

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Merchants National Bank

Trust Department

740 Chapel Street, New Haven, Connecticut

New England Yachting Season Opens

(*Continued from page 67*)

The Pleon Yacht Club, the oldest juvenile yachting organization in the country, has a brave schedule of six championship races between July 1st and September 9th, punctuated by a Midget title event for harbor boats late in July, team races with Cohasset during the Mid-summer series, a cruise late in August as far as Newcastle, N. H., and a grand 40th anniversary regatta on Labor Day.

A team of yachtsmen from Chicago will visit Marblehead and sail a series of races on the change-a-boat plan with a team of the Corinthian Yacht Club, all hands using Class Q boats.

The Boston Yacht Club fleet will cruise on the Maine coast again, going as far east as Northeast Harbor, and stopping at Newcastle, Peak's Island, Winnegance Bay, Five Islands, Christmas Cove and Camden on the way down the coast. The club will hold the customary Mid-summer regatta at Marblehead, and will manage the races for the Manhasset Bay Cup, which the R Class boat *Ellen*, owned by Charles P. Curtis, won last year. At the Hull station the club will stage a regatta and illumination on August 20th under the direction of Quincy Tucker.

The season at Duxbury will be almost as intensive as that at Marblehead, with 40 races for men and women, boys and girls, between June 25th and September 10th, including a Mid-summer series early in August for Plymouth Bay classes. The fleet at Duxbury this year will number nearly 100 yachts in five classes, of which the famous Duxbury "Ducks," a 14-foot waterline knockabout designed by Alden and built by Chaisson, is the largest. Cohasset will open as usual on June 25th with races every Saturday until Sept. 10th and on Wednesdays in July and August, except on August 10th, when most of the boats will be at Marblehead. The club will hold the South Shore eliminations for the junior championship during the week of August 15th, and the fourth Massachusetts Women's Sailing Championship for the Mrs. Charles Francis Adams cup on Sept 6th–9th.

The Beverly Yacht Club season starts on June 17th, and includes 15 championship races for four classes, the race for the Van Renssalear Memorial Cup and a three days meet on August 2–4 for New York forty-footers, cruisers and smaller classes in the vicinity of Buzzard's Bay. It is understood that the three Class R yachts owned in the club will not be in commission this year.

First New England Launchings

(*Continued from page 46*)

beautiful craft with black topsides and teak and mahogany fittings. She is 73 feet, 6 inches in length over all, 55 feet on the water line, 18 feet beam, and 9 feet draft.

The owner of the yacht, Mr. Saltonstall, is a member of the Eastern and Beverly Yacht Clubs. *Arbella* will have her home port at Pocasset this summer and will make a splendid addition to the Buzzards Bay yacht fleet.

On April 6th a handsome new motor yacht slid into the Town River at Quincy, Mass., from the launching ways at the yard of F. D. Lawley, Inc. This was *Harriet*, designed by Fred D. Lawley for Charles H. Jones, of Boston, and a well known member of the Eastern Yacht Club.

The boat was christened by Miss Harriet Jones. The dimensions are as follows: 68 feet length over all; 67 feet, 9 inches length on the water line; 14 feet beam; and 3 feet, 9 inches draft.

Dispatch, a 46-foot express cruiser designed by L. Francis Herreshoff for Rear Commodore Charles A. Welch, of the Corinthian Yacht Club, was launched some weeks ago at the yard of Britt Brothers in West Lynn. This boat is equipped with two 200 horsepower Cross-Kysor engines driving twin screws and will be used largely as a tender to the new 20 rater *Live Yankee*.

Instant, Easy Starting
Easy Starting
Instant, Easy Starting
Quarter Turn Starting
Easy Starting
Instant, Easy Starting
Easy Starting
Quarter Turn Starting
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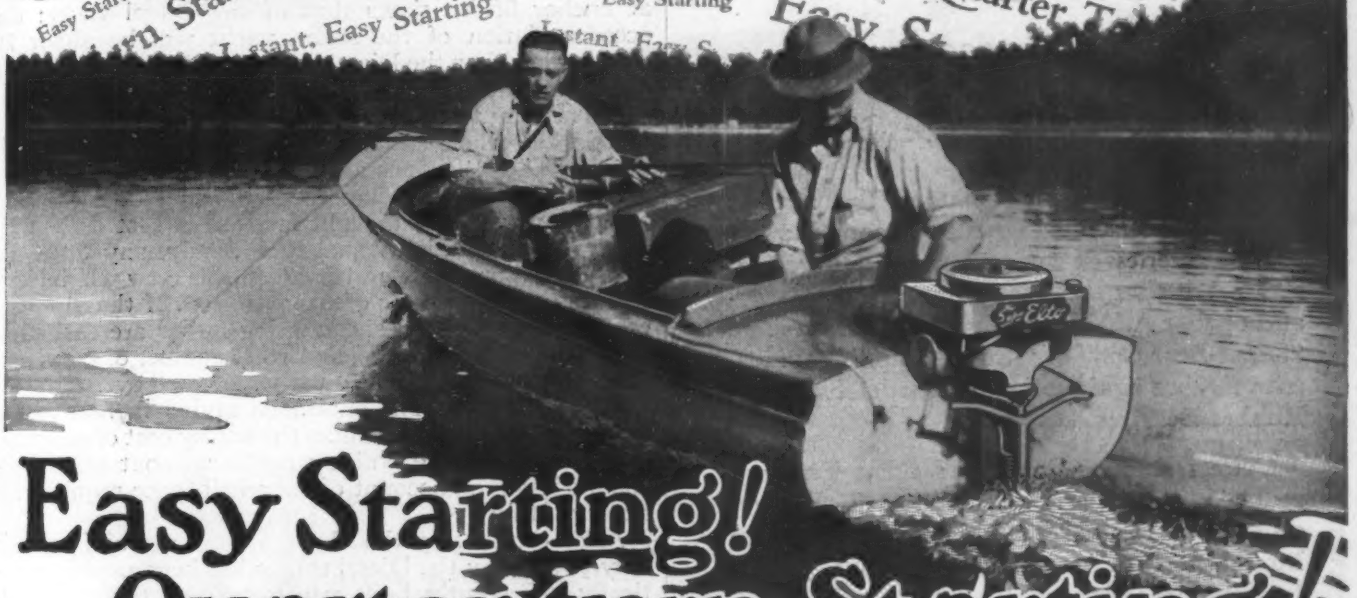

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QUARTER TURN! That's what makes all the difference in the world! Effortless. Merely an easy three-fingered flip of the flywheel—and instantly there's the deep-chested response! And away you go! *That—THAT* is easy starting!

You'd no more sacrifice *that* — once you knew it — than you'd go back to hand cranking your car.

Battery ignition! That is *one* of the reasons for Elto's easy starting. Columbia Hot Shot Battery — billions of fat, sizzling sparks that fire regardless of rain or cold or cranking speed. Battery *plus* the famous Atwater-Kent Timer.

Plus fundamental motor design uncompromisingly engineered to make the most of full battery ignition. *Those* are the reasons for Elto's easy starting.

For yourself — and for the pleasure of every member of your family — *quarter turn starting!*

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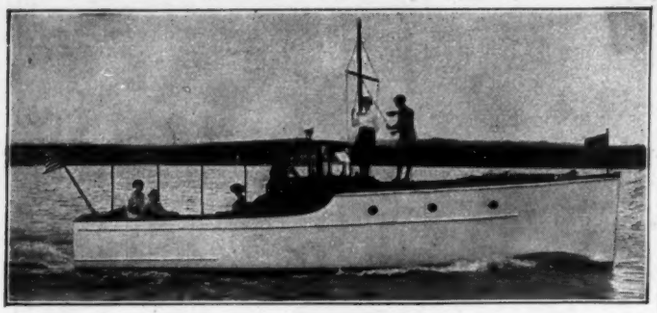
The Super Elto
"Starts with a quarter turn"



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No standardized cruisers upon the market today surpass A.C.F. in quality of construction or completeness of equipment. It is, therefore, significant that the entire line of 35-, 41-, 47- and 68-foot A.C.F. cruisers, and the Belle Isle "Super-Bear-Cat," of which A.C.F. is sole distributor, are equipped with Goodrich Cutless Rubber Bearings.

Cutless Rubber Stern and Strut Bearings reduce vibration and outwear bearings of any other type. Highly recommended for use with Monel metal or bronze shafting. Specify them for your new boat.

Write for new booklet, "Goodrich Cutless Rubber Bearings for Marine Service."

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Cutless (Rubber) Bearings

—FOR STERN TUBES AND STRUTS

The Use of Diesel Engines in Yachts

(*Continued from page 37*)

in the crew. While underway the fuel cost of the steam yacht will be three times, and when at anchor fifteen times that of *Ohio*. Any additional fuel carried in the steam yacht must be accompanied by loss of accommodation, which, if any such steaming radius is desired as in *Ohio*, means a steam yacht of far greater size, first cost and cost of operation.

If a similar comparison be made in the case of the conventional coastwise steam yacht, about 130 feet on the waterline, the results are approximately as follows: The steam yacht will carry fuel sufficient only for ten days, the Diesel yacht for sixty days; the steam yacht's cost of fuel per hour will be, when steaming, three times, and when at anchor fifteen times that of the Diesel yacht; the accommodation of the steam yacht will be about 20 per cent less than the Diesel yacht, and her crew will be 25 per cent greater.

When comparisons are made of seagoing or coastwise vessels, the whole situation may be summed up as follows: If Diesel engines are used in place of steam, the vessel's dimensions being the same in either case, an owner can secure at a slight increase in first cost much more accommodation, equal speed, and many times the cruising radius possible with steam, his crew will be less, and all operating costs greatly reduced. If the same accommodations, speed and cruising radius are desired in the steam yacht, her size, first cost, number of crew, and all operating costs will be greatly increased over those for the Diesel yacht. The enormous saving in fuel in the Diesel yacht not only reduces the hourly cost of steaming but permits a large cruising radius without loss of accommodation on account of the small space required for stowage of fuel.

After considering the above statements of fact it is easy to see why the Diesel engine has been used in practically all recently built yachts, except those of such small dimensions or light construction as to make this type of engine unsuitable.

It is also most interesting to study the present large fleet of noteworthy Diesel yachts and to compare their general characteristics with the older fleet of steam yachts which they have replaced. The Diesel yachts in practically every instance will be found to be of rugged construction, heavy displacement and in every sense wholesome, seagoing craft, whereas far too many of the steam yacht fleet were lightly built, narrow, unwholesome vessels suited only for coastwise work, and that under favorable weather conditions.

The Diesel engine is undoubtedly largely responsible for this improvement in type. As even a small Diesel yacht can carry sufficient fuel for a transatlantic voyage, it is only common sense to take advantage of this fact and design vessels capable of going to sea. This result alone would justify the use of Diesel power, irrespective of the many other individual advantages.

As yachtsmen have become more familiar with the staunchness and reliability of the modern type of Diesel yacht, even of relatively small size, their interest in yachting has naturally been greatly increased.

Undoubtedly the Diesel engine has come to stay. Its use will continue to increase as its merits become appreciated, and its character and design are adapted to a greater range of conditions. Already its use has really revolutionized the ideas of yachtsmen, and naval architects have taken the fullest advantage of its possibilities. The modern Diesel yacht represents the acme of luxury, comfort, seaworthiness and dependability. Also the reduction in the size of yachts made possible by the use of this machinery, and the lower cost of fuel, tends to reduce the cost of yachting—a highly desirable accomplishment.

Banfield Sea Skiffs *for* Speed, Luxury *and* Seaworthiness

THE famous Banfield Sea Skiffs have long been noted for their outstanding performance among yachtsmen who seek out smartness of design accompanied by staunch construction and unsurpassed handling qualities. Three sizes are built — the 30-foot Sailfish Model — the 34-foot De Luxe Model and the 38-foot De Luxe Model. Banfield Sea Skiffs are well and favorably known and their popularity is a proven fact among a discriminating class of sportsmen — yachtsmen along the Atlantic Coast, in Florida and on the Great Lakes. Specifications, details, speeds and prices will be furnished on request and definite delivery dates may be secured on any one of the three models.

The Banfield Sailfish Model standardizes on the famous Kermath 100 h.p. marine motor which gives guaranteed speed of 18 miles per hour to this particular model

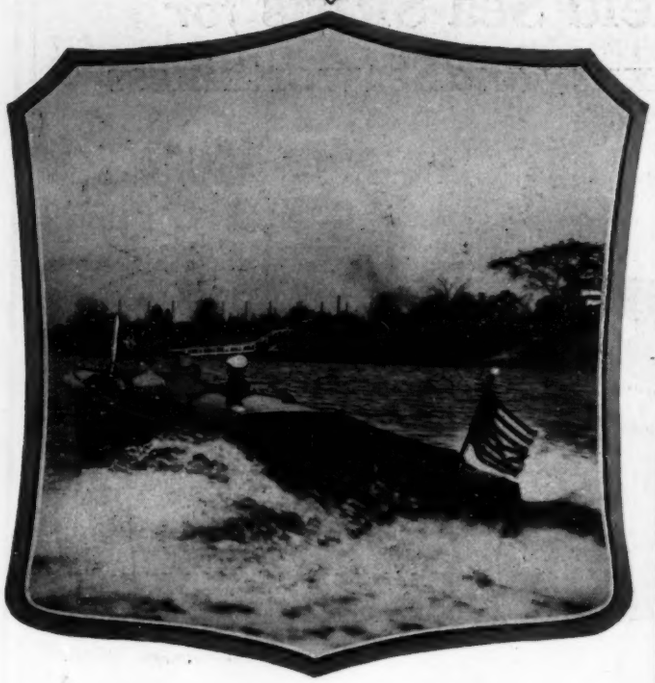
$4950

Afloat Atlantic Highlands, N. J.

BANFIELD SEA SKIFF WORKS INC.

Largest Builders of Sea Skiffs in the World

ATLANTIC HIGHLANDS, NEW JERSEY.



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Diesel Electric Drive for Yachts

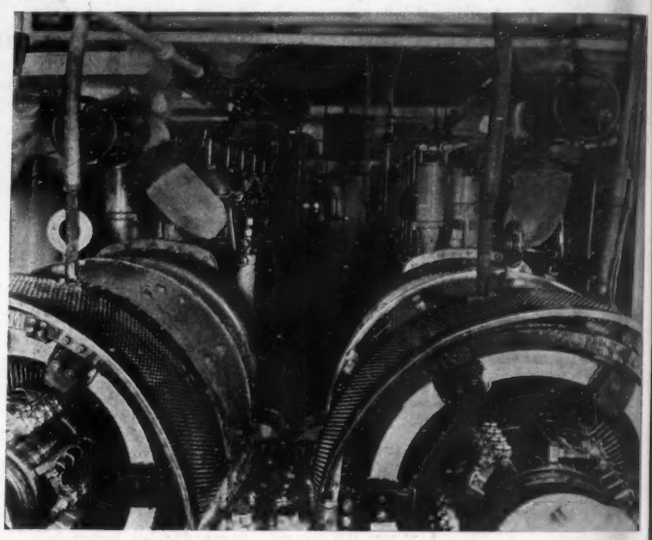
(*Continued from page 42*)

over 40 pumps. The quantity of piping and wiring, mostly hidden away from the sight of the casual guest, is amazing.

Now that we have briefly considered what the Diesel electric drive involves, let us glance at the advantages and disadvantages as compared with steam machinery and direct Diesel installation. A steam installation consists of a unit or units for generating steam (boilers), an engine, a condenser, steam piping, smokestacks, bunkers for coal or tanks for fuel oil, feed pumps, blowers, etc. A direct Diesel installation requires a reversing Diesel engine or, in small boats, a clutch and reverse gear and the usual Diesel auxiliaries.

Why then go to the added expense of the electrical equipment of the Diesel electric?

Some of the principal reasons are that both the steam unit and the direct Diesel are required to run at propeller speeds and for propeller efficiency these speeds should be kept low. This means large, heavy, slow speed engines.



The two Diesel engines and generators of the *Cutty Sark*.

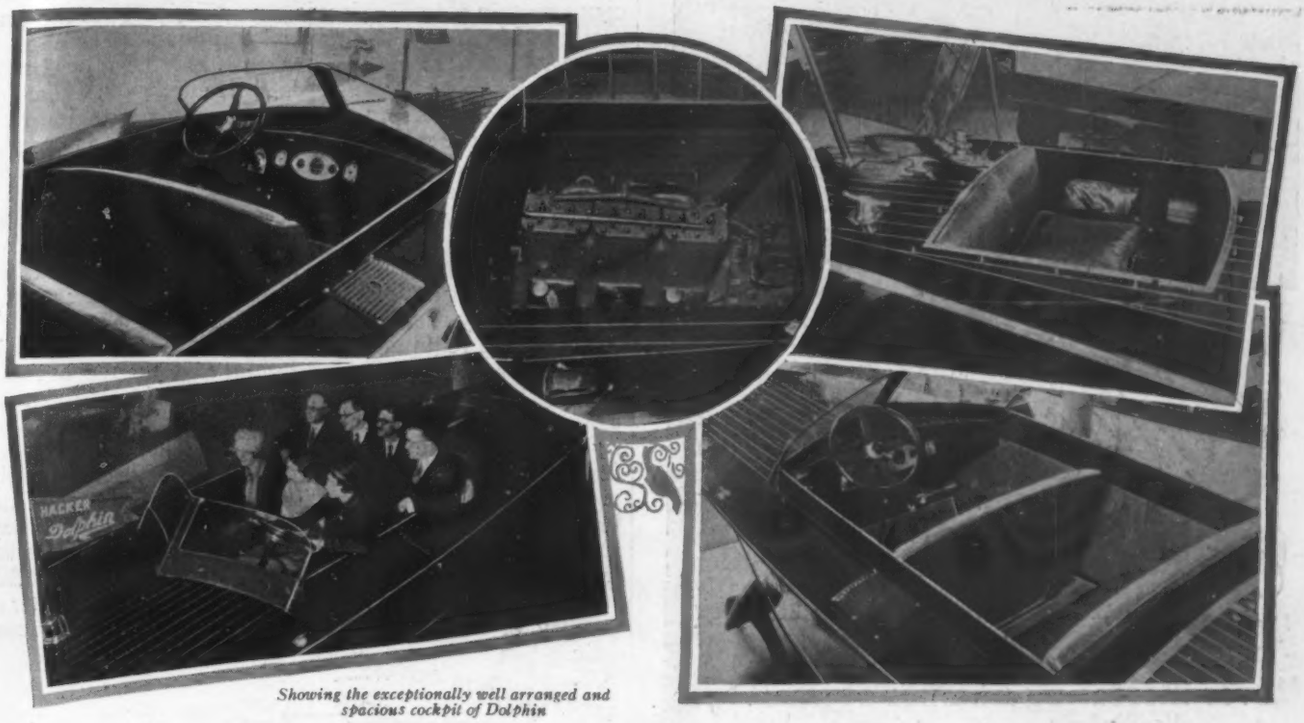
Much smaller, lighter, higher speed engines can be used with the Diesel electric system. The total power required can be furnished by any number of generating sets, and often a number of small units can be placed to better advantage than one large unit or, in the case of twin-screw boats, two units. Again, these generating units can be placed well forward and the motor well aft without carrying heavy shafting through the length of the boat.

In the case of sailing auxiliaries, the advantage is very pronounced, for here it is desirable to install a single feathering propeller and not go to twin screws. Yet the power generation can be divided into any number of units desired.

Some of the reasons for discontinuing the use of steam installations and adopting Diesel engines were: The high cost of fuel due to the amount required; the limited radius of action owing to the uneconomical use of the fuel; the time required to get, and the necessity of keeping, steam in the boilers; frequent refueling and the dirt incidental to handling coal; the soot from oil burners; the necessity of firemen and coal passers; excessive heat from the boilers, engine and piping; the space required for boilers, engine, coal bunkers, coal chutes, etc.

The early, heavy, cumbersome Diesel engines were in some respects an improvement over steam equipment. The present-day Diesel is a still better proposition. The

HACKER DOLPHINS



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Seating seven to nine passengers comfortably, this little craft will ride *over* rough waters in perfect dryness at better than thirty miles an hour. The performance and superior riding qualities of this little thoroughbred can only be appreciated by actual demonstration.

Built from the best of materials obtainable, under the personal supervision of John L. Hacker. Equipped in the finest possible manner. *Really a custom-built boat.* Ride in this craft and let us show you Dolphin superiority. Fastest marine motored runabout of its power built. Price, completely equipped with Model FS Scripps motor.....$3450.

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28-ft. DOLPHIN DELUXE. *The Incomparable Runabout.* Through the incorporation of certain Hacker principles of design, the Dolphin Deluxe has greater riding comfort and seaworthiness than boats of much larger size. Besides it is the most refined, finest equipped and fastest marine-motored stock runabout of its price built. Price, completely equipped with Model G Scripps Motor, **$4950.**

Commuters

FROM the Jersey Coast, from "up the Hudson" and from the harbors of Long Island Sound an ever-increasing number of small fast yachts are bearing their owners daily during the Summer to and from business.

From the comfort and convenience of arrangement and fittings *to* the dependability of the powerful Speedway Engines, the fast Consolidated Commuters, are without a rival.

Details of any size or type of boat will be gladly furnished on request—Yacht Tenders, Day Cruisers, Commuters, Yachts.

We have, just off the press, a Section of our Catalogue, illustrating and describing Commuters. May we send it to you?

Consolidated Shipbuilding Corp.

Morris Heights, N. Y.

Makers of ***Yachts*** and ***Speedway*** Engines

direct drive Diesel is probably the most economical power installation known, even taking into account the first cost as well as cost of operation and upkeep.

The introduction of the electric drive brings into account certain electrical losses, due principally to the generation of heat by the electrical equipment. These losses range between 12 and 17 per cent. On the other hand, there seems to be a gain in propeller efficiency, where the propeller is driven by an electric motor with its even torque, over the same propeller driven by a reciprocating engine, either steam or Diesel, and this in part compensates for the electrical losses.

The economy of operation of a multiple unit installation is marked, for, when less than maximum speed is required one or more units can be cut out entirely and the units remaining in operation can be run at their normal rating, usually their most economical point.

The space required for a Diesel electric installation is about the same as that required for direct drive, but usually less height is necessary. The weight, also, is about the same, as the weight of the electrical equipment is balanced by the gain made in using lighter, higher speed engines for generating purposes. In the direct drive it is usually essential to place the machinery near the center of the length, but with a Diesel electric plant the machinery may be distributed throughout the boat without carrying long and heavy shafting with it. When it comes to stability, the Diesel electric equipment gives a lower center of gravity of machinery weights — a desirable characteristic.

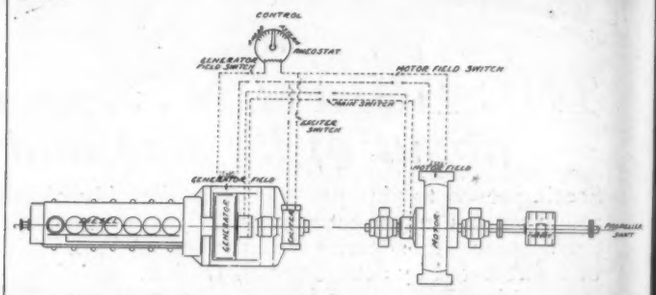


Diagram showing wiring between generating set and propelling motor.

With either direct drive Diesel or Diesel electric propulsion, provision must be made for driving the auxiliary equipment, such as windlass machinery, steering gear, etc., either electrically or hydro-electrically. With the Diesel electric, power for electrical use can be taken from the propulsive equipment when these units are in operation and it is not necessary to run the auxiliary engines. This is an advantage over the direct drive system.

The following yachts have Winton Westinghouse Diesel electric equipment:

The two-masted auxiliary schooner yacht *Elfay*, designed by Herreshoff, 162 feet in length over all; one 125 h.p. generating set.

The three-masted schooner yacht *Guinevere*, designed by A. L. Swasey, 195 feet in length over all; two 300 h.p. generating sets.

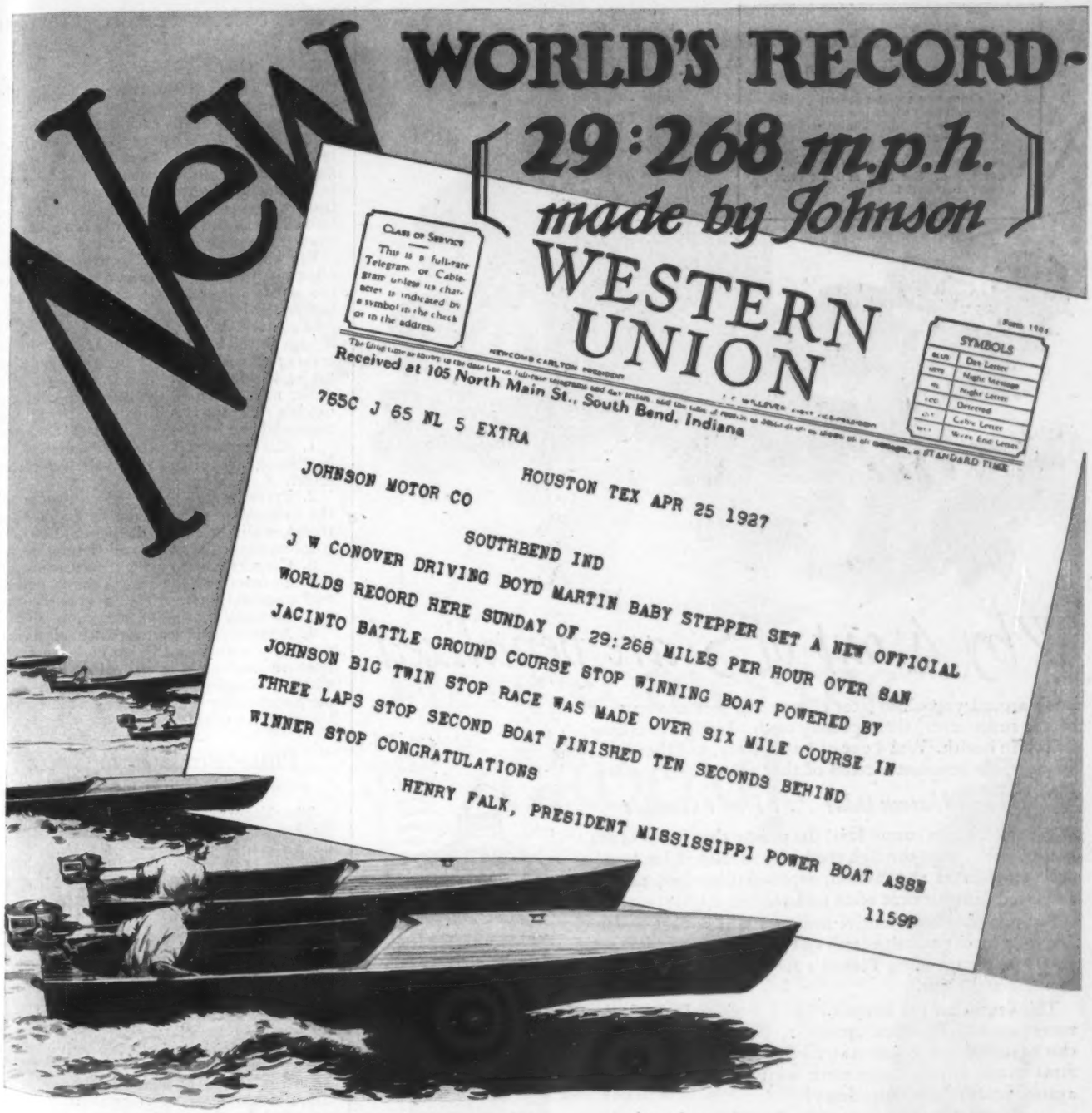
The yacht *Valero II*, designed by Capt. Hancock and William Muller, 125 feet in length over all; two 150 h.p. generating sets.

The two-masted auxiliary schooner yacht *Cutty Sark*, designed by Tams & King, 147 feet over all in length; two 100 h.p. generating sets.

The three-masted auxiliary schooner yacht *Alcyone*, designed by Tams & King, 182 feet in length over all; two 225 h.p. generating sets.

The auxiliary bark *Aloha*, designed by Tams & King, 218 feet in length over all; three 300 h.p. generating sets.

Between August, 1925, and September, 1926, or, in twelve months and twelve days, the Diesel electric yacht *Guinevere* cruised nearly 42,000 miles, mostly under power.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SINCE 1925 when a world's record of 16.68 m. p. h. was made, Johnson has continued making new records and breaking them as fast as established.

Twice this year has Johnson set a new world's record—and broken it.

This newest record of 29.268 m. p. h. carries its own significance. It means a type of outboard motor performance that is without precedent. It emphasizes the inbuilt quality and stamina of Johnson Motors.

Johnson Motors are sold by sport goods, hardware and marine supply dealers. They will gladly let you take one for trial. *Write for catalog.*

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Outboard Motors

This Habit Pays Dividends

Of those you see in a dentist's waiting room only a very few are there of their own accord. The others are seeking relief from pain. As a simple health measure, let your dentist prevent trouble. It is far easier than correction. See him at least once every six months.

Why 4 out of 5 are penalized

Look around you. The faces of men and women you pass on the street reveal the appalling truth. Neglect is taking its toll in health. And 4 out of 5 after forty, and thousands younger, are innocent victims of that grim foe—Pyorrhea.

At These Uneven Odds . . . Don't Gamble

What an insidious enemy it is! Its poison that forms at the base of teeth creeps through the body. Health is destroyed. Such troubles as rheumatism, stomach disorders, anemia and facial disfigurement often follow.

But two simple preventive measures will protect health. Let your dentist examine teeth and gums at least twice each year. And start using Forhan's for the Gums, regularly, morning and night.

This dentifrice, the formula of R. J. Forhan, D. D. S., for many years a Pyorrhea specialist, prevents Pyorrhea or checks its vicious course—if used regularly and in time. It firms gums; also it keeps teeth white and protects them against acids which cause decay!

You Can Be Sure Of This

Forhan's Antiseptic Refreshant does just what we promise for it. It safeguards mouth, nose and throat against oral infection and relieves unpleasant breath instead of concealing this embarrassing trouble behind a tell-tale odor. Thousands are now keeping breath sweet and fresh this sensible way. Try it. At all druggists, 35c and 60c.

So, to be on the safe side, start using Forhan's for the Gums, now. Teach your children this good habit.

Unlike ordinary tooth pastes, it contains Forhan's Pyorrhea Liquid used by dentists everywhere in the treatment of Pyorrhea. It is health insurance. All druggists, in tubes, 35c and 60c.

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FOR THE GUMS
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Forhan's *for the gums*

MORE THAN A TOOTH PASTE . . . IT CHECKS PYORRHEA

New Safety Feature Prevents Fire

(*Continued from page 82*)

through the carburetor, thereby holding the fire inside the carburetor.

The pressure of the carburetor is released through the release safety valve. The air intake is shaped so as to form a pocket to hold any escaping gasoline caused by the engine being flooded by too much choking. This feature prevents the gasoline from leaking into the boat and consequently is a great aid toward the prevention of fire.

Furthermore, this feature conserves gasoline and makes for better performance when the motor is cold. Excessive choking, and consequently flooding, occurs when the cold motor is being started. The flooded gas is kept in the bowl or pocket D, and the incoming air rushes rapidly over this gasoline, taking it up gradually and thereby giving a richer mixture when the motor is cold and needs a rich mixture. To sum up the advantages claimed for the new safety carburetor:

1. Eliminates danger of fire caused by backfiring or spitting through the carburetor.
2. Prevents gasoline from leaking through the carburetor when engine is flooded and therefore eliminates the danger of fire from a gasoline-soaked boat around the engine.
3. Conserves gasoline by preventing the gasoline from leaking through the carburetor and re-uses this gasoline to give a richer mixture when the engine is cold.
4. Adds to the performance of a cold motor by automatically supplying a richer mixture and making use of the gasoline which ordinarily leaks out through the ordinary carburetor when the engine is flooded by excessive choking.

Philadelphia Firm Opens New York Branch

The Yachtmen's Service Agency of 534 Real Estate Trust Building, Philadelphia, have recently opened offices at 530 Singer Building, 149 Broadway, New York City. These offices will be in charge of Mr. Fred Brown, Jr.

Westinghouse Secures Contract for World's Largest Diesel Electric Drive

The contract to supply the electric propulsive and auxiliary equipment for the conversion to Diesel-electric drive of the former United States Shipping Board tanker *District of Columbia*, which will be the largest drive of this type ever installed, has been awarded to the Westinghouse Electric & Manufacturing Company. The *District of Columbia* was built in February, 1921, by the Baltimore Dry Dock & Ship Building Company. She has a length overall of 450 feet, a beam of 59 feet and a moulded depth of 33 feet 3 inches. The vessel has a total cargo tank capacity of 83,146 barrels and a displacement of 14,760 tons.

The original propulsive machinery consisted of geared cross compound Parsons turbines driving a single screw. The working steam pressure was 200 lbs., developing 2,800 shaft h.p. at 90 r.p.m. The designed sea speed was ten knots. All auxiliary equipment was driven by steam.

The new propelling equipment comprises four 8-cylinder, 2-cycle Busch Sulzer Diesel engines of 1,000 shaft h.p. each, four 700 kw. d-c generators direct connected to the engines, and one double armature propelling motor, rated 3,200 h.p. at 90/105 r.p.m. Excitation for the generators is supplied by two 175 kw. machines direct connected to each of the outboard Diesel engines. The propelling motor, generators and exciters are of the forced ventilation type.

Propeller Efficiency

The Hyde Windlass Company, Bath, Maine, will send to readers of YACHTING their new catalog, a handsomely printed and illustrated booklet of 48 pages containing constructive suggestions for increasing the speed and efficiency of motor boats. A section is devoted to the important matter of "How to measure the pitch of a propeller."

The new Hyde Quadrant Filler, shown in the illustration, is a decided improvement

The new Hyde Quadrant Filler.

over the usual type quadrant. It is made of Hyde Manganese Bronze, not brass, and is rigidly constructed. A special feature is the method of securing the tiller cable by means of clamps on the center web. The cable follows the grooves, through openings in the side webs and thence to the clamps, one end of the cable passing over and the other end under the center web. The clamps are fitted in such manner that the ends of the cable are fastened individually, making adjustment and removing of slack an easy operation.

The new Motor Boat Mart at Chicago, recently established by Hubbard H. Erickson, where the stock boats of the principal manufacturers are on display.

Motor Boat Mart a Success

Hubbard H. Erickson, who recently established, at 1725 Diversey Blvd., Chicago, a showroom where stock boats of all the principal manufacturers may be seen, announces that the mart has already proved a great success. The opening of this mart has provided the only place in the United States where all types of runabouts and cruisers are permanently exhibited.

Toppan Building Many Boats

Through a typographical error there was omitted from the list of yachts building in New England, published in the May issue of YACHTING, any reference to the number of boats the Toppan Boat & Engine Company, of Medford, Mass., are now building.

This yard is particularly busy and at present is building four 30-foot, one 26-foot and nine 22-foot motor boats, and several 22-foot dories.

Here comes the GROOM!

All eyes are on *him* this June. For the old chap's got something more than the cutaway coat, the striped trou, the spats and shiny topper. He's got a handsome face that fairly smiles:

"I shave with Barbasol!"

So grateful to the skin. So easy on the temper. So saving on the time. So smooth and silky-nice while the razor's working, and so cool and clean for hours after. Here's the Barbasol Shaving March:

1. **Wash the face** (but leave it wet)
2. **Spread on Barbasol** (but don't rub in)
3. **Shave**

No brush. No rub-in. No after-smart. Barbasol leaves the natural oils right in the skin. Takes nothing away but the whiskers. Great for chap and ingrowing hairs.

***Mister, you're next!* Try Barbasol 3 times, according to directions.**

Barbasol

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Indianapolis, Ind.

I enclose 10c. Please send trial tube and I'll give it a fair trial.

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Address.....

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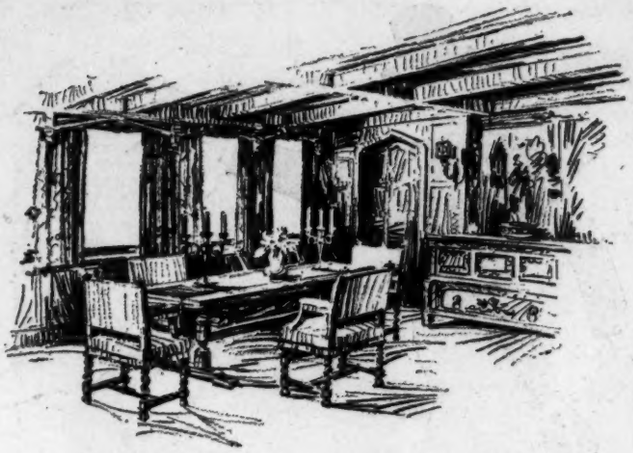

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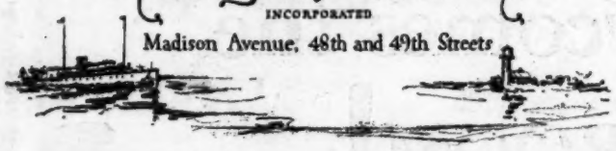

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CALVIN P. MOON, formerly associated with Henry J. Gielow and the Lake Torpedo Boat Co.

J. MCAULEY, formerly Chief Engineer of the Steam Yacht *Alberta* and lately with the Bessemer Gas Engine Co.

Details of the more important work now in progress and scheduled will be given in future announcements

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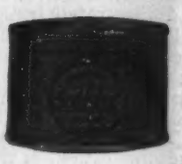
Gold Seal Butter



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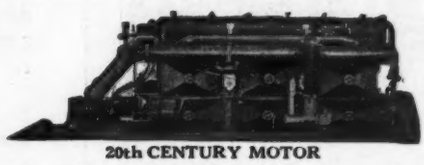

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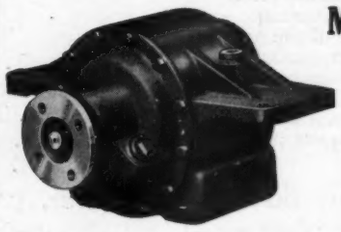
Let US figure NOW on your new yacht

New York Yacht Launch and Engine Co.

Morris Heights, New York City



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Adds Speed and Fuel Economy

For pleasure and commercial craft, 30 to 70 feet—capacity up to 125 h.p. at 1700 r.p.m. of engine. Absolutely quiet, ball bearings, water cooled, ratio 1.75 to 1.

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